

Royal Commission

on Canada's Economic Prospects

The Future
of
Canada's Export Trade

by R. V. Anderson

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ROYAL COMMISSION ON CANADA'S ECONOMIC PROSPECTS

**THE FUTURE OF
CANADA'S EXPORT TRADE**

by

ROGER V. ANDERSON

MARCH 1957

*While authorizing the publication of
this study, which has been prepared at
their request, the Commissioners do
not necessarily accept responsibility
for all the statements or opinions
that may be found in it.*

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PREFACE

THE AIM of this study is to examine the prospects for Canada's export trade in the light of the present position and past developments. Thus the first two chapters of Part A are concerned with the historical record, and, both in the examination of the likely world trading environment in Chapter 3 and in the consideration of the outlook for particular export commodities in Part B, the observations about probable developments are based upon past experience.

Chapter 1 of Part A is concerned with the nature and significance of commodity exports in the period since 1926, the first year for which many of the relevant statistical series are available in substantially their present form. In general, the war years have been omitted in this examination and the data have been carried up to the end of 1955. Partial data for 1956 have become available as the study was in preparation and, while no formal cutoff date was established, only selective use could be made of this information. The examination of past developments is continued in Chapter 2 which deals with factors influencing Canada's exports and their geographic distribution.

The future of the world trading environment, or the framework within which Canada's exports are likely to move, is considered in Chapter 3. In addition to some observations on the general conditions which may affect international trade as a whole, and Canada's exports in particular, this chapter contains a separate examination of the position and prospects for each of the main areas in Canada's trade. For each area, the general approach has been to look at population, Gross National Product, the role of imports, and commercial and financial policy, with observations on the nature of the developments which might be expected.

Next in logical sequence comes the outlook for exports, commodity by commodity. It was considered that any attempt to project Canada's exports must be based upon analysis of the markets for and availabilities of the individual commodities entering into the trade. While Canada's exports fortunately fall into a limited number of usable groups, this section of the exercise is still so lengthy that it seemed desirable to place it in a separate part of the study, Part B. In general, the more important commodity sections in Part B cover the export position of the commodity, Canadian production, Canada's place in world production and trade and the market outlook. The consideration of the market outlook, along with production

possibilities, leads to a judgment on the outlook for exports in 1980. In only a few cases are comments offered on prospects for intervening years.

The commodity analysis in Part B draws upon material from many sources, Canadian and external, official and private, and including the publications of international organizations. Of particular use have been the submissions to the Royal Commission, the Commission hearings and the drafts of studies prepared by the Commission staff. The export study bears a close and obvious relation to other work which has been undertaken by the Commission. The over-all forecast must fit into the national accounts projections; the views on exports, both over-all and regional, must be consistent with the conclusions put forward in the import study. Further, and more specifically related to Part B of the present study, exports are dealt with in many of the Commission's detailed industry studies. As all of the Commission's work moved forward at the same time, much of the work for the export study was done independently, at least initially. For some commodities, however, considerable use has been made of preliminary material prepared for the industry studies and, in all cases, an attempt at reconciliation has been made. Generally, any apparent differences from the versions of the industry studies available when this study was completed result from the use in this study of classification, valuation techniques, or considerations more appropriate where the major concern is with exports. In particular, the individual industry studies have to some degree considered export prospects without limiting the projections suggested in the light of the over-all payments positions anticipated in customer countries. This is probably appropriate there, as it is impossible to predict with any certainty the commodities which will be most affected by such limitations. In the export study, however, it has been necessary to consider such limitations and, in so far as they can be anticipated, to make some commodity distribution of their effects. While no fundamental differences are believed to remain other than from this cause, the fact that various studies went forward simultaneously has meant that in some cases preliminary drafts were used (and cited) and that it was not possible to make anything like complete use of all of the relevant material which will appear.

The results obtained in Part B are drawn together and summarized in the final chapter of Part A. This chapter also contains a review of the qualifications which apply to the projections and an adjustment to the over-all forecast. The final section deals with the adjusted forecast, the anticipated relation between exports and Gross National Product, and the expected distribution of exports by commodity and by area. In short, it presents a summary of the findings of the study.

Any attempt to suggest what may happen in the future, especially at the end of a period as long as 25 years, quickly runs into a multitude of uncertainties. Judgments about domestic and external developments must be made. Then, within this framework, estimates — but they are still

estimates — of what appear to be reasonable prospects for exports can be reached. While it has not been thought useful to provide explicit margins of error or ranges in this study, the projections can only be regarded as possibilities. Someone else undertaking the task might equally well suggest a different set of numbers. The one thing that is quite certain is that the projections will be inaccurate in detail. Figures are employed to suggest possible magnitudes but should not be interpreted as indicating a belief that these exact magnitudes, or something very close to them, will necessarily result. It is hoped, however, that the study offers a set of projections which are reasonable possibilities and internally consistent, under the basic assumptions underlying the Commission's work. The most important of these assumptions are that there will be continued international tension but no global war, that there will be no major depression and that there will be no major change in governmental policies as they affect economic activity.


The present study owes a great deal to discussions with and comments received from the other members of the Commission staff. Especially, I am indebted to Mr. Simon S. Reisman, under whose direction the study was undertaken. As noted, other studies being prepared by the staff have been drawn upon, and valuable help has been received from material prepared by Mr. George T. McColm. Extensive assistance in gathering and processing statistical material was provided by Mrs. Audrey Oades; much of this material has not been incorporated into the study in tabular form, but it has provided an essential basis for the analytical work.

The personnel of government departments and the Bank of Canada have been most co-operative in providing basic source material and other information. Particular thanks are due to Mr. C. D. Blyth who, in addition, read and commented upon lengthy sections of the manuscript.

My participation in the work of the Commission was made possible by the generous arrangements for leave of absence made by the International Monetary Fund. Of course, neither the Fund nor the people outside the Commission staff who have assisted in the preparation of the study bear any responsibility for the views expressed.

R. V. A.

Ottawa,
March, 1957



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Note on Data and Projections

In tables throughout the study, the following symbols are employed:

— = magnitude is nil;

0 = magnitude is less than half of the unit of measurement employed.

In tables relating to past periods, totals do not necessarily equal the sum of the constituents because of rounding.

Unless otherwise noted, the symbol "\$" refers to Canadian dollars current during the period to which the data refer. Projections are expressed in 1955 Canadian dollars, in the sense that an unchanged general level of prices is assumed. They do, however, take account of certain changes in individual prices which have already taken place or which may be anticipated. Projections for commodity exports are rounded to multiples of \$25 million in the case of exports to all areas, and to multiples of \$5 million in the distribution by areas. Projected invisible receipts (from all areas) are offered in multiples of \$50 million. The margins of error or ranges, although they are not explicitly set forth, are wider than those implicit in the rounding operation.

EXPORTS IN THE CANADIAN ECONOMY

THE PURPOSE of this chapter is to present a brief picture of the nature and significance of Canada's exports over the past 30 years. In the main, it is concerned with commodity exports or exports of goods, although some attention is also paid to the relationship of these exports of goods to exports of services and other elements of the balance of payments. In addition to examining the over-all significance of exports to Canada, the commodities exported, and their destinations, it is necessary to devote some time to a consideration of the way in which exports may be measured and classified. Some of these statistical problems are relegated to the Appendices; but as at least a summary consideration of them is necessary to the rest of the chapter, this has been retained in the text. Accordingly, the chapter begins with the problem of measurement.

I. The Magnitudes

(a) The Measurement of Exports

In attempting to describe the movement of Canada's exports over past periods, it is not possible to select one series and to say that it necessarily represents the changes which have taken place in Canada's export trade or indicates the significance of exports in the Canadian economy. For the consideration of any particular problem it is necessary to make a selection from among a number of equally authentic sets of export data. In addition, it may be felt that a series can be made to convey a more meaningful picture of developments if certain adjustments are made to it.¹

The basic export data published by the Dominion Bureau of Statistics (D.B.S.) cover separately (1) exports of Canadian produce, excluding gold, sometimes called domestic exports or domestic merchandise exports to indicate the exclusion of gold; (2) exports of foreign produce, or re-exports;

¹ The magnitudes involved in the various export series and adjustments are indicated in the table appearing in Appendix A.

and (3) new gold production available for export or for addition to Canada's international exchange reserves.² For some purposes in this study, for example, in considering exports to particular countries, use is made of the data on domestic merchandise exports only. For other purposes, for example, in looking at the commodities important in Canada's total export trade, the concept of domestic exports is expanded to include new gold production available for export.³ In yet other cases, as where the relation of exports to the rest of the economy is examined, re-exports are added to domestic merchandise exports and gold to obtain a concept covering total exports of goods.

For some purposes, it is desirable to make adjustments to the basic data published by the D.B.S. One of these adjustments has to do with wheat exports. For the period from August 1936, when they first became available, until the end of 1946, it is felt that the export clearance data issued by the Board of Grain Commissioners reflect more accurately the true nature of Canada's wheat exports than do the customs returns on which the D.B.S. (*Trade of Canada*) data are based. This adjustment, which is made in this study, affects both the over-all total of exports and their distribution among customer countries. In addition, a more substantial adjustment is made to the *Trade of Canada* data for the period 1926 to 1936 to cover the diversion of wheat from the United Kingdom to the continent of Europe. This adjustment, however, does not affect the total value of exports to all countries.⁴

Two further adjustments to the export data are employed in this study in those places where international comparisons are involved, in an effort to make the Canadian data more nearly comparable to those available from other countries.⁵ The first of these adjustments arises from a peculiarity of the Canadian data in that they exclude charges for inland freight and insurance incurred in moving exports to the border. As almost all countries value their exports at the border, international comparability requires that an estimate of the cost of such freight and insurance be added to the value of Canadian exports. The second adjustment concerns the addition of the value of defence equipment or supplies transferred by Canada to NATO countries. The D.B.S. publishes data on the value of these supplies but does not normally include them in the export totals.

² The basic sources of Canadian trade data employed in this study are the monthly, quarterly and annual issues of *Trade of Canada* published by D.B.S. Use has also been made of the D.B.S. *Canadian Statistical Review* (monthly) and *Review of Foreign Trade* (semi-annual), as well as of the Bank of Canada's *Statistical Summary*. In general, specific citations are not given to the source of the trade data, but, in such cases, the source is *Trade of Canada*.

Where undocumented references are made to U.S. trade data, the sources are the publications of the U.S. Department of Commerce, particularly the Bureau of the Census' annual and monthly *Report No. FT 110, United States Imports of Merchandise for Consumption, Commodity by Country of Origin*.

Similarly, U.K. trade data have been obtained from the publications of Her Majesty's Stationery Office, particularly the monthly *Accounts Relating to Trade and Navigation of the United Kingdom*.

³ The nature of "new gold production available for export" is described in Section 32, Part B, of this study.

⁴ Both of these adjustments are described more fully in Appendix D.

⁵ Such international comparisons employed in this study are based on data appearing in the International Monetary Fund's *International Financial Statistics*, published monthly.

Strict comparability over time would require that, for the period prior to Newfoundland's entry into Confederation, Newfoundland's exports to countries other than Canada should be added to the Canadian export data and Canada's exports to Newfoundland should be deducted. An estimate of the total amount of this adjustment can be made, but it is not possible to allocate the adjustment among commodities or among customer countries. For this reason, and because the over-all adjustment can only be approximate, it has not been applied in this study. Where exports to or by Newfoundland were significant, this fact has been considered in the analysis of the exports of specific commodities. Further, in considering the destination of Canada's total trade, exports to Newfoundland have been deducted in arriving at percentage figures.

When the balance of payments is constructed to show estimates of transactions between residents of Canada and residents of other countries over a given period of time, various adjustments are made to the value of merchandise exports obtained from the trade statistics. These adjustments, however, are minor in relation to the total value of exports. They include the wheat adjustment already described, the removal of exports of settlers' effects and private donations which have no payments significance, the removal of tourist exports for inclusion elsewhere in the balance of payments, and adjustments to reflect more accurately the timing of certain transactions.⁶

In considering the balance of payment implications of export movements, it is often useful to add to adjusted receipts from the export of goods receipts from such current international transactions as freight, tourist and dividend earnings. This yields total current receipts, which, when set against total current payments, provides the current surplus or deficit in the balance of payments. Considerable interdependence exists between merchandise exports and many other items in the balance of payments. An obvious relationship exists between the level of exports and the level of freight receipts (including inland freight on exports). Higher exports will also tend to mean increased imports of required materials and equipment, while larger incomes derived from exports will mean increased spending on other imported goods. On the other hand, prosperity in the export industries will tend to induce an inflow of capital to pay for the imported equipment. A number of other interrelationships may also be observed.

For the total importance of exports in the Canadian economy — that is, the contribution of export to Gross National Expenditure — it may also be desired to cover not just exports of goods, but exports of goods and

⁶ Throughout the study, balance of payments data are based upon the D.B.S. *The Canadian Balance of International Payments, 1926 to 1948*, and the annual and quarterly issues of *The Canadian Balance of International Payments* published by the Bureau.

For convenience of reference, Canada's 1955 balance of payments is reproduced in Appendix B to this study.

The tourist exports which are included in *Trade of Canada* and removed in the balance of payments adjustment cover only goods which follow the tourist out of the country. Those accompanying the tourist are not included in the trade statistics but are covered in the balance of payments estimate of tourist receipts.

services. The concept of exports of goods and services is the same as total current receipts in the balance of payments, except for the deduction from the balance of payments figure of the amount received on account of inheritances and immigrants' funds.

The export measures so far discussed all relate to the value of exports, that is, to the amount of trade expressed in dollars. The D.B.S. also publishes indexes of the price and of the volume or physical quantity of Canada's exports, covering both total exports and each of the main commodity groups. Indexes are not, however, published for exports by destination. Price, or unit value, indexes and volume indexes — derived by dividing the price indexes into indexes of total value — suffer from certain limitations recognized by the Bureau.⁷ Nevertheless, the series are believed to represent price and quantity movements with reasonable accuracy for the periods 1926 to 1940 and since 1946, with some measure of time distortion for 1926 to 1930.

(b) Movement of the Value and Volume of Exports, 1926 to 1955

The value of Canada's domestic exports, including new gold production available for export, reached an interwar high of \$1,380 million in 1928. This peak was followed by a four-year decline to a low of \$560 million in 1932, and then by a five-year increase to \$1,176 million (adjusted for wheat) in 1937. A wartime high of \$3,533 million in 1944 was followed by a decline in the immediate postwar period.⁸ Subsequently, however, the value of exports, including gold, rose to a high of \$4,452 million in 1952. Although the next two years saw a decline, the 1955 figure was \$4,437 million and that for the 12 months ended November 30, 1956, reached \$4,763 million.

Changes in export values are the product of changes in volume and changes in prices, generally in the same direction. Consequently, if value, price and volume are all plotted as index numbers, the value series shows much wider fluctuations than do the price and volume series. On 1948 bases, the indexes of the volume and the price of Canada's domestic exports, excluding gold, showed a more or less parallel decline between 1928 and 1932. Between 1932 and 1933 the volume index increased while there was a further slight decline in prices. Throughout the rest of the 1930's the volume index remained substantially above the price index on 1948 bases (or on bases translated to 1928 or 1932). In the initial postwar period, from 1946 to 1950 or 1951, prices increased more rapidly than did volumes. From 1951 to 1955, however, the price index tended to decline, so that an increase in

⁷ For example, wheat prices might remain completely unchanged between one year and the next but there might be a considerable deterioration in the quality of Canada's exports. Unless allowance is made for this, the change would show up as a decline in the price index. The volume of wheat would not be reduced to reflect the quality deterioration, but the decline in the unit value of wheat would tend to reduce the price index for the agricultural group and for total exports, thus producing a tendency to a volume increase. The Bureau states that some allowance can usually be made for major departures from the normal composition of an export item. It is, however, impossible to eliminate all spurious changes in price and volume.

⁸ Wartime figures are not fully comparable to those for other periods because of the problem of attaching prices, in a normal sense, to exports of war materials.

volume about re-established the relationship existing in 1928. 1932 and 1948. Both price and volume have increased during 1956, but the latter rise has been much more rapid.

On its 1948 base, the volume index of Canada's exports, excluding gold, fell from 66.5 in 1928 to 39.5 in 1932. In 1936 the index returned to its 1928 level and, while exports rose sharply during the war, volume calculations are omitted as they are felt to be probably misleading. During the postwar period, the export volume index rose irregularly to a high of 118.5 in 1955. Thus, the increase in the volume of exports between 1928 and 1955 was about 78%. Over the same period, the export price index rose at about the same rate, so that the total value of exports more than tripled.

(c) *Exports and Gross National Product*

Dollar figures on the value of exports, presented by themselves, convey little about the role of exports in the country's economy. Volume indexes covering a period of time show changes in the quantity of exports but tell nothing about their size in absolute terms or in relation to other measures of economic activity. Perhaps the most useful measures of the significance of export in the Canadian economy are those emerging from comparison with Gross National Product (G.N.P.) and with the other constituents of Gross National Expenditure (G.N.E.). G.N.E. (at market prices) is the total amount spent on the goods and services produced by Canadian residents during a period. This is the same as the market value of all goods and services produced by Canadian residents, which is called Gross National Product (at market prices).

Total spending on goods and services produced by Canadian residents, or G.N.E., is presented in the *National Accounts* published by the D.B.S. and equals personal expenditure on consumer goods and services, plus government expenditure on goods and services, plus gross domestic investment (including the change in inventories), plus exports of goods and services, minus imports of goods and services. Two of these five items, consumer expenditure and imports, have usually been regarded as being in large measure closely determined by the level of disposable income and G.N.P. It is to be stressed, however, that this relationship assumes an unchanged institutional framework. If the framework changes - if tariffs rise, if taxes are increased or if family allowance payments become greater - this would tend to produce changes in these items (*i.e.*, in consumer expenditure or imports) not caused by changes in G.N.P., but themselves causing G.N.E. and G.N.P. to change. Otherwise, however, it has been usual to ascribe a relatively passive role to consumer expenditure and imports and to regard government spending, investment and exports as playing a more dynamic role, capable of being affected by other elements (as when increased consumption induces increased investment) but also capable of independent variation and resulting in magnified changes in income and G.N.P.

The three more active constituents of G.N.E. are not wholly independent of each other. For example, interdependence exists between exports and investment. A high and increasing level of exports may lead businessmen to invest in facilities, the purpose of which is to make possible additional exports in the future. Similarly, investment may be undertaken independently of the present level of exports, although not independently of expectations as to export markets, and this may make possible increased exports in the future. Clear examples of the latter case are to be found in the post-war iron ore and petroleum developments. Government spending and exports may be related, as in cases where an increase in exports either calls forth or is conditional upon the development of transportation or other facilities. Government spending and investment also may go hand in hand, with one or the other playing the initiating role.

Despite this interdependence, there was a general tendency before the war to assign to exports a major role in the determination of Canadian incomes. Investment spending moved with business activity and expectations, and consumption followed along behind the prime movers. But it was exports, and investment associated with the development of export industries, to which the major causal significance was ascribed.⁹ The dominant position ascribed to exports was supported by the fact that exports were normally much more important than investment or government spending and by the close parallelism between the movements of exports and existing measures of national income.

If exports of goods or exports of goods and services for the period 1926 to 1955 are plotted on a chart with G.N.P. (or G.N.E.), the series can be seen to have moved in a closely parallel fashion, except for the war years, with the fluctuations in the export series tending to be relatively somewhat wider than those in G.N.P. If annual data are employed, there were small declines in exports between 1926 and 1927 and between 1948 and 1949 which were not accompanied by a decline in G.N.P. Otherwise, when exports have risen or fallen, G.N.P. has also risen or fallen. In the cases of the decline in exports from 1928 to 1932, the increase after 1932 and the decline from 1952 to 1954, the turn in G.N.P. came in the following year. The other export turning points — down in 1937–38, up in 1938–39 and up in 1954–55 — were accompanied by G.N.P. movements in the same direction and in the same year.

Despite the general parallelism, however, there has been some drift downward in the contribution of exports to G.N.E., a drift which is more

⁹ See, for example, A. F. W. Plumptre, *Central Banking in the British Dominions*, Toronto, 1940. Speaking of the situation in the British Dominions generally: "Despite the spread of secondary industries and the countries' growing self-sufficiency, changes in export incomes are still the independent variables of first importance. Periods of prosperity are based upon rising prices of export staples, rising volumes of exports, and — if the country is still pretty young — upon the import of capital." (pp. 367–368.)

Similarly, W. A. Mackintosh in *The Economic Background of Dominion-Provincial Relations*, a study prepared for the Royal Commission on Dominion-Provincial Relations, Ottawa, 1939, stated in his final chapter: "In the past, the rate of [Canadian] economic growth has been dependent on the expansion of exports and the related volume of investment." (p. 102.)

apparent if the abnormal years of the early 1930's and the war are excluded. The nature of the movement is indicated by the following table.

*Canada's Exports as a Percentage of
Gross National Expenditure*

	1926-28	1936-38	1946-48	1954	1955
Goods, including gold					
Total exports	23.1	21.4	20.1	16.8	16.8
Excl. agriculture (a)	11.3	15.0	13.8	13.2	13.2
Goods and services					
Total exports	29.6	28.6	26.3	21.2	21.5
Excl. agriculture (a)	17.8	22.1	20.1	17.6	18.0

(a) Excludes agricultural and vegetable products and animals and animal products as shown in the statistics, other than alcoholic beverages, rubber and products, and fish and fishery products.

SOURCES: D.B.S., *National Accounts, Income and Expenditure*; and *Trade of Canada*.

Between the late 1920's and 1954-55, exports of goods have fallen from 23% of G.N.E. to 17%, with the decline since 1948 being more rapid than that over the previous 20 years. Exports of services have also declined in importance, again more rapidly since 1948. From 1926-28 to 1955, the fall of goods and services from 29.6% of G.N.E. to 21.5% is an almost identical relative drop that occurred in goods.

The foregoing table also shows that the fall in the importance of exports to the Canadian economy, which occurred between the late 1920's and recent years, was entirely accounted for by the relative decline in agricultural exports from 11.8% of G.N.E. in 1926-28 to 3.1% in 1955. The relative importance of non-agricultural exports rose over the period, although the 1954-55 percentages were below those for 1936-38. Outside of agriculture, the role of exports in the Canadian economy has not declined. Nevertheless, exports as a whole today make a smaller relative contribution to the generation of incomes and G.N.P. than they did 30 years ago, and non-agricultural exports are less important than they were in the immediate prewar period.

The decline in the role of exports has been associated with an increase in the relative importance of the two other constituents of G.N.E. which exert the main stimulating force. Only in one year between 1926 and 1946 — in 1929 — did the export of goods fail to exceed gross domestic investment and, from 1931 to 1938, investment was far below exports. Beginning in 1947, however, investment has exceeded exports in every year. Similarly, in each prewar year except 1931 and 1932, exports of goods exceeded government expenditure on goods and services. Immediately after the war, the old relationship was re-established. Government spending, however, began to rise rapidly after 1950 and, from 1953 to 1955, has been greater than exports. Present prosperity thus rests upon investment and government

spending to an extent far greater than would have been expected on the basis of experience from 1926 to 1939. In addition, the institutional framework has to some extent altered through the increase in transfer payments such as family allowances, making possible higher levels of consumption corresponding to given levels of G.N.P. Exports retain considerable direct importance and they still bulk sufficiently large in the economy that export levels and export prospects have had an important effect in inducing investment and government spending. Nevertheless, exports would appear to have lost part of their significance in determining Canadian incomes and G.N.E. and G.N.P.

II. The Commodities

(a) *Canada's Major Exports, 1926 to 1955*

The commodity distribution of Canada's exports in the years 1928, 1932, 1937, 1954 and 1955 is indicated in Table 1. That table lists 17 major commodities and commodity groups (some of which are quite broad) covering 80% to 85% of total domestic exports, including gold. As regards

Table 1

CANADA'S DOMESTIC EXPORTS OF SELECTED COMMODITIES (percentages of total domestic exports, including gold)

	1928	1932	1937	1954	1955
Wheat and wheat flour.....	36.1	26.1	15.5 (a)	11.5	9.3
Barley, oats and rye.....	3.5	2.5	1.0	3.2	2.2
Meats.....	1.4	1.1	3.5	1.3	0.9
Fish and products.....	2.6	3.2	2.4	3.2	2.8
Lumber.....	3.5	2.3	3.8	8.1	8.7
Wood pulp.....	3.3	3.4	3.6	6.7	6.7
Newsprint.....	10.2	14.8	10.7	15.8	15.0
Asbestos and products.....	0.8	0.5	1.3	2.1	2.2
Aluminum and products.....	0.7	0.7	1.6	4.6	4.8
Copper and products.....	1.7	2.9	4.8	3.3	3.9
Lead and products.....	0.8	0.6	1.5	1.0	0.8
Nickel and products.....	1.6	1.2	5.0	4.5	4.8
Zinc.....	0.6	0.7	1.3	1.4	1.6
Iron ore.....	0.0	0.0	0.0	1.0	2.3
Chemicals (b).....	1.3	2.0	1.9	4.0	4.7
Sundry manufactures (c).....	9.6	7.0	9.8	9.5	8.0
New gold available for export....	2.9	12.5	12.3	3.8	3.5
All other commodities.....	19.3	18.6	20.2	14.9	17.7
Total.....	100.0	100.0	100.0	100.0	100.0

(a) Based upon Board of Grain Commissioners' rather than customs data.

(b) Fertilizers, synthetic rubber, uranium and other chemicals.

(c) Alcoholic beverages; rubber products; textiles and products; electrical apparatus; engines and boilers; farm machinery and implements; non-farm machinery; automobiles, trucks and parts; other vehicles, chiefly of iron; guns, rifles and other firearms; railway track material of iron; other manufactures of iron and steel; ships and vessels; aircraft and parts; cartridges, gun and rifle.

SOURCES: D.B.S., *Trade of Canada*; and Bank of Canada, *Statistical Summary*.

the choice of years, 1928 saw the highest value and volume of Canadian export in the interwar period; 1932 was the year of deepest depression; 1937 was the most prosperous of the years immediately before the war; 1954 and 1955 are the most recent years for which complete data were available at the time of writing; and, in addition, the volume of exports reached a new high in 1955.¹⁰

The major change shown in the table has been the decline in the relative importance of exports of wheat and flour, from 36% of the total in 1928 to 9% in 1955, and the relative increase in the exports of a number of other primary commodities.¹¹ Among agricultural exports, declines in the share of the total have also been registered by barley, oats and rye, and meats. These two commodity groups, however, have moved quite differently over the years between 1928 to 1955. Barley, oats and rye declined sharply in relative importance between 1928 and 1937 and have since become more important; meats, on the other hand, became considerably more important between 1928 and 1937 and have subsequently fallen below the 1928 relative level. Exports of fish and products have fluctuated relatively narrowly in the years covered by the table.

Among the notable relative increases in Canada's major exports have been those registered by lumber, wood pulp, and newsprint, which together amounted to 17% of the total in 1928 and to 30% in 1955. Newsprint alone has risen from 10% of the total in 1928 to 15% in 1955, making it Canada's most important single export. The present share of newsprint, however, while substantially greater than in 1928 or 1937, is comparable to that obtaining in the depths of the depression.

Even more striking has been the growth of the metals and mineral listed in the table. Asbestos, aluminum, copper, lead, nickel, zinc and iron ore accounted for 6% of Canada's total domestic exports in 1928 and for 20% in 1955. All of these commodities except lead have shown substantial relative increases between the two years, with the largest percentage changes appearing in aluminum and iron ore. Unlike the other metals and minerals, copper, lead and nickel showed a relative decline between 1928 and 1955, although for copper and nickel the 1955 figures were substantially above those for 1928.

An exception to the general pattern, under which exports of agricultural commodities have been displaced by forest products and metals and minerals, has been the remarkable growth in exports of chemicals and allied products, a group which includes fertilizers, synthetic rubber and uranium oxide, as well as other chemicals. Relative growth in the export of these

¹⁰ The table in Appendix C shows more detail on the commodities in Canada's exports for the periods 1926 to 1939 and 1946 to 1955.

¹¹ Although 1928 was a peak year for Canada's exports of wheat and flour, these exports had accounted for 33% of total domestic exports (including gold) in the two-year period 1926-27.

commodities has been faster than that in any other commodity or commodity group in the table with the exceptions of aluminum and iron ore.¹²

Exports of a group of sundry manufactures showed relatively little change between the years 1928, 1937 and 1954, although they declined somewhat, both absolutely and relatively, in 1955. The 15 commodity groups making up this category, however, have behaved very differently. An absolute decline was registered by rubber products, while relative declines were registered by alcoholic beverages; automobiles, trucks and parts; and other manufactures of iron and steel, including railway track material. On the other hand, exports of farm machinery and implements, and non-farm machinery showed relative increases, while very great relative increases were achieved by exports of electrical apparatus; engines and boilers; other vehicles chiefly of iron; guns, rifles and other firearms; ships and vessels; aircraft and parts; and cartridges. Exports of textiles and products about retained their relative importance between 1928 and 1955. With most of these commodities, however, the postwar period has witnessed considerable variation in their relative importance.

The final commodity identified in the table — new gold production available for export — has behaved in its own fashion, rising from 3% of total exports in 1928 to 12% of the total in 1932 and 1937, and becoming Canada's second most important export in the latter year. Since the war, gold production has dropped back to little more than its relative importance in 1928.

(b) D.B.S. Classifications

Table 1 presents a classification of Canada's exports into major commodities and commodity groups; a more detailed breakdown appears in Appendix C. Similar classifications are presented by the D.B.S. in the *Canadian Statistical Review* and by the Bank of Canada in its *Statistical Summary*.¹³ The D.B.S. also presents a number of other classifications in Volume I of the annual issue of *Trade of Canada* and in the semi-annual *Review of Foreign Trade*. All of these D.B.S. classifications exclude gold and cover wheat on the basis of customs data rather than on the basis of data provided by the Board of Grain Commissioners.¹⁴

The first of the D.B.S. classifications which may be examined is that which divides exports into nine *main groups* on the basis of *component material*. In addition to its annual publication, this classification appears

¹² This statement still stands, although with less force, if an adjustment is made to eliminate the estimated value of exports of uranium oxide from the 1955 figure for chemicals and allied products. After such an adjustment, exports of chemicals amounted to 4.2% of the total in 1955, as compared to 1.3% in 1928.

¹³ In the November 1956 issue of its *Statistical Summary*, the Bank of Canada began publication of a new classification covering a number of commodities and commodity groups, and showing exports to the United States, the United Kingdom and all other countries, and in total.

¹⁴ Using customs data for wheat exports, 1937 exports are reduced by \$33 million or by 3.2% of domestic merchandise exports adjusted for wheat but excluding gold.

in the monthly issues of *Trade of Canada* and the series runs back to the year ended June 30, 1891. If this grouping is examined for the years selected in the previous sub-section, the most striking change is the steady decline in the relative importance of exports of agricultural and vegetable products from 49% of the total in 1928 to 18% in 1955. Exports of animals and animal products rose from 12% of total export in 1928 to 14% in 1937 but then declined to 6% in 1955. Wood, wood products and paper, on the other hand, rose from 22% of the total in 1928 to 36% in 1955, while non-ferrous metals and products (including electrical apparatus) increased from 8% to 19%. Exports of iron and products and non-metallic minerals and products have also increased, from 5% to 9% and from 2% to 5%, respectively. These increases have been assisted in recent years by the growth in exports of iron ore and crude petroleum. Exports of chemicals and allied products have also grown rapidly, from 1.4% of the total in 1928 to 5% in 1955. Finally, exports of fibres, textiles and products and of miscellaneous commodities are relatively unimportant and have varied up and down with little clear trend.

This classification indicates certain broad trends of considerable significance. Nevertheless, each of the categories is heterogeneous and interpretation gives rise to a number of problems. For example, electric washing machines appear in iron and products, electrical motors in non-ferrous metals and products, and electric refrigerators in miscellaneous commodities. Similarly, bicycles and automobiles are in iron and products, while tricycles and aircraft are in miscellaneous commodities. Alcoholic beverages are found in agricultural and vegetable products; waste rubber and rubber manufactures are also in agricultural and vegetable products, but synthetic rubber is in chemical and allied products; synthetic fibres are included with fibres, textiles and products; books are with wood, wood products and paper; and clocks and watches, as well as most electrical apparatus, are found with non-ferrous metals and products.

Adjustments could be made to the data presented in this component material classification to overcome many of the difficulties which have been suggested. Indeed, such adjustments are made in the other D.B.S. classifications which are discussed below. Nevertheless, the difficulties which have been suggested apply to a relatively small proportion of the exports in each category and the classification shows clearly the remarkable changes which have been taking place in the composition of Canada's exports.

A variant of the component material classification is that based upon *origin*, in which commodities are assigned to categories on the basis of the primary activity through which the material for any given commodity is provided, rather than according to the material itself. Thus commodities are divided according to whether they are of farm origin (subdivided into Canadian farm products and foreign farm products, and further subdivided

into field crops and animal husbandry), wildlife origin, marine origin, forest origin, mineral origin, or mixed origin. The farm origin category comprises the agricultural and vegetable group, the animal and animal products group, and the fibres, textiles and products group of the component material classification – less fur skins and products, and fish and products, which form the wildlife and marine origin groups. Canadian farm products refer to commodities actually produced in their original form on Canadian farms, while foreign farm products cover materials or commodities such as Canada does not produce – for example, cane sugar, tea, rubber, cotton, silk, etc. The forest origin group is virtually equivalent to the wood, wood products and paper group. The mineral origin group takes in iron and its products, non-ferrous metals, and non-metallic minerals, as well as certain chemicals. The mixed origin group consists primarily of chemicals and allied products and the miscellaneous commodities.

For 1955, 20% of Canada's domestic exports are shown as being of farm origin, 1% of wildlife origin, 3% of marine origin, 36% of forest origin, 35% of mineral origin, and 6% of mixed origin. The changes over the past 30 years can be seen from the fact that, for the fiscal year ended March 31, 1927, the classification shows 55% of Canada's domestic exports as being of farm origin, 23% of forest origin, 16% of mineral origin and 2% of mixed origin.

The next classification, which is by *degree of manufacture*, groups together all raw or unprocessed materials in one category. All materials which have undergone some processing but which must be further manufactured before final use are in a second group. All manufactures which are processed to the stage at which they can be finally used, as well as manufactured end products, are in a third category. This classification is available back to 1900 and the classifications showing exports by component material and by origin are also subdivided according to degree of manufacture. The series suggest that, although fully or chiefly manufactured exports have fluctuated as a percentage of the total, they have retained much the same relative importance over the past 30 years. The chief long-run changes which appear are a decline in the relative importance of raw materials and a rise in partially manufactured goods. These movements are shown in the following table.

*Canada's Domestic Exports to All Countries
by Degree of Manufacture
(percentages, based upon annual averages and 1955 data)*

	Fiscal years		Calendar years		
	1926-29	1936-39	1946-49	1951-54	1955
Raw materials	46.7	32.2	27.2	30.5	26.3
Partially manufactured	14.8	25.0	24.9	30.6	35.4
Fully or chiefly manufactured	38.5	42.8	47.9	38.9	38.3
Total	100.0	100.0	100.0	100.0	100.0

SOURCE: D.B.S., *Review of Foreign Trade, Calendar Year 1955*, pp. 42 and 45.

As is noted by D.B.S., caution must be exercised in using this classification.¹⁵ Only the raw materials category is generally homogeneous. Partially manufactured goods include such simply processed items as asbestos fibres and such relatively highly processed commodities as wood pulp. The third category contains such diverse items as dried apples, wheat flour, newsprint, farm machinery, automobiles and refrigerators.¹⁶ In addition to the fact that the data may be misinterpreted from the point of view of pure description, it should be stressed that there are among the "fully or chiefly manufactured" goods a number which move in international trade subject to influences more similar to those affecting raw materials than those affecting manufactures in the more normal sense. This applies with particular force to such staple exports as wheat flour and newsprint. A similar observation can be made with respect to "partially manufactured" goods, the category which contains the bulk of Canada's exports of non-ferrous metals and their products. Finally, the details of Canada's trade statistics have altered over the years, with the regrouping and subdivision of items. As a result, elements of inconsistency over time are introduced into this classification.

In the D.B.S. *classification by purpose*, exports are grouped according to the use that will be made of them in the form in which they are traded. Under this scheme, 79% of Canada's domestic exports in 1955 fell into the category of producers' materials. This category is further broken down in the classification presented in Volume I of *Trade of Canada*. However, 64% of the total of producers' materials in 1954 was in the sub-category "manufacturers' materials — for other manufacturing industries". Most of the remaining producers' materials were for foodstuffs and beverages, building and construction materials, and fodders. The remaining items in the purpose classification for 1955 were as follows: producers' equipment, 5%; fuel, electricity and lubricants, 0.6%; transport, 2.1%; auxiliary materials for commerce and industry, 0.3%; consumers' goods, 9.2%; live animals for food, 0.1%; and miscellaneous and unclassified, 4.0%. In 1954, 75% of the consumers' goods was food. Changes in the classification scheme make difficult the comparison of these data with those from the late 1920's. Data are, however, available on the same classification basis for the late 1930's. An examination of those for the year ended March 31, 1938, suggests that, in this year, consumers' goods, transport, and live animals for food were relatively much more important than in 1955. Producers' materials and, to a less extent, the other items except the miscellaneous group were less important.

A final regrouping of the items in the Canadian export statistics, within the framework of the *Standard International Trade Classification* (S.I.T.C.)

¹⁵ See, for example, D.B.S., *Review of Foreign Trade, Calendar Year, 1953*, p. 31, and *Calendar Year, 1955*, p. 42.

¹⁶ It is of interest that wood pulp, classed as partially manufactured, has a higher value per ton (\$129.30 in the first half of 1956) than does newsprint, which is regarded as fully or chiefly manufactured (\$118.50).

of the United Nations, has been prepared by the D.B.S. for each year since 1950. The S.I.T.C. was created in part in an effort to overcome difficulties in comparing the trade statistics of different countries. Also it has the purpose of providing a standard form under which trade data can be reported to various international agencies. The S.I.T.C. is essentially a hybrid, combining the principles of purpose, degree of manufacture and component materials. Its groups, however, are relatively homogeneous.

Canada's 1955 merchandise exports (domestic exports plus re-exports but not including gold) fall into the following main groups under the S.I.T.C.: food, 18.3%; beverages and tobacco, 2.1%; inedible crude materials, 30.4%; mineral fuels, lubricants and electricity, 1.3%; animal and vegetable oils and fats, 0.3%; chemicals, 5.6%; manufactured goods, 34.2%; machinery and transport equipment, 6.5%; miscellaneous manufactured articles, 0.7%; and miscellaneous transactions and commodities, 0.6%. Since 1952, exports of food have declined from 29% to 18% of the total, while beverages and tobacco have remained largely unchanged at about 2%. Inedible crude materials have risen from 25% to over 30% of total exports. Important in this category are lumber, wood pulp, non-metallic minerals, and metallic ores, scrap and concentrates. Chemicals, including some items not so classified in the Canadian statistics, such as crude artificial abrasives, have risen from 3.4% in 1952 to 5.6% of the total in 1955. Manufactured goods have also risen — from 30% in 1952 to 34% in 1955 — but this category includes refined base metals, not necessarily taken beyond the ingot stage. Canada's exports of machinery and transportation equipment have declined in relative importance since 1952, from 9.2% of the total to 6.5%.

The D.B.S. is currently engaged in the preparation of a *standard commodity classification* which will apply not only to statistics of exports and imports but to all or virtually all the data on commodities put out by the Bureau. This new classification is being constructed to present commodities in the following main sections: live animals; food, feed, beverages and tobacco; inedible crude materials; inedible fabricated materials; and end products. The segregation and classification of end products is expected to produce the greatest changes as, in the new classification, these are to be arranged according to their use or function rather than according to component materials. The component material principle, however, is still to be retained in classifying crude and fabricated materials.

(c) *The Nature of Exports, 1926 to 1955*

The data which have been presented in the two preceding subsections indicate an important relative shift in Canada's exports, from agricultural commodities to forest products and metals and minerals. In addition, most of the rapid increase in the export of chemicals has been in commodities with a mineral origin — such commodities as fertilizers, synthetic rubber, uranium oxide, plastics, cobalt oxide and salts, and calcium compounds. Other important chemical exports, cellulose products, are based upon wood.

Although the interpretation of the statistics is subject to a number of pitfalls which have been indicated above, the relative shift away from agricultural commodities has been accompanied by an increase in the extent of the processing of goods in Canada before they are exported. The bulk of forest products and base metals are subjected to some degree of processing before leaving the country, although in many cases the commodity exported must still undergo substantial transformation before ultimate use. The change does not, however, appear to have resulted in any increase in the proportion of Canada's exports which are in a fully manufactured form in any real sense. The data in the last table indicate that exports which the D.B.S. classifies as "fully or chiefly manufactured" have about retained their share of the total between the late 1920's and recent years. The Bureau also notes that, if newsprint and wheat flour are removed from this category, its share actually diminished.¹⁷ There appears to have been relatively little change in the degree of manufacture in the forest products group, with the share of the group accounted for by lumber, wood pulp and newsprint rising from 81% in 1928 to almost 89% in 1955. With the notable exception of iron ore and nickel, the data on metals and minerals presented in Table 1 include manufactures of these materials. Although classification changes make the data difficult to analyze, there appears to have been a small shift away from the raw product — ores, concentrates, scrap, etc. — to the refined product and manufactures in the case of asbestos, aluminum, copper and nickel taken together. This shift, however, is being offset by the very rapid increase in exports of iron ore and crude petroleum. As regards the various manufactured goods gathered together into one item in Table 1, their share in Canada's exports was largely unchanged between 1928 and 1954 and it declined between 1954 and 1955. The decline over the whole period, however, was more than offset by the increase in the exports of the other secondary industry reflected in the data, i.e., the chemical industry.

Canada's exports thus contain a high proportion of primary manufactures such as newsprint, partially manufactured articles of a primary nature such as lumber and wood pulp, and refined metals and minerals. Despite the shifts that have taken place, exports remain heavily concentrated on basic staple commodities. Secondary manufactures, although numerous, are relatively unimportant in the aggregate. Among the major exports upon which Canada's trade depends, the past 30 years show no evidence of a shift away from basic primary commodities in their raw or processed form.

In the past, dependence upon exports of staple commodities, subject to wide fluctuations in world demand, constituted an ever-present danger to the stability of the Canadian economy. Writing at the end of the 1930's, Professor Mackintosh noted that the proceeds of wheat exports would continue to be liable to marked variations. The proceeds of gold exports

¹⁷ D.B.S., *Review of Foreign Trade, Calendar Year, 1955*, p. 44.

were likely to fluctuate inversely to the fluctuations in other exports. Newsprint exports had demonstrated their variability in the face of business fluctuations, although the industry did not need to be inherently unstable. Base metals, because of their use in durable goods of which they represented a small fraction of the total cost, were subject to wide fluctuations in price. Lumber, too, was likely to show marked variability as an export, both in volume and price, because of its dependence on construction cycles and the relatively high transportation costs. "Thus, while it is not necessary to assume a recurrence of the purely fortuitous coincidence of agricultural and industrial crises and prairie drought, it is entirely probable that Canada will experience in the future sharp variations in the proceeds of exports. Under stable world conditions these will be less than under unstable conditions, but under any conditions the Canadian economy will be liable to relatively great fluctuations."¹⁸ Such views were widely held. Part of the task of this study is to attempt to assess to what extent, if any, they remain appropriate today.¹⁹

Canada's exports currently show only a moderate degree of commodity concentration in comparison with other countries which export primarily basic materials and foods. In 1955, 15% of Canada's domestic exports consisted of newsprint, 9% of wheat and wheat flour, 9% of lumber and 7% of wood pulp. In contrast, it may be noted that, in the same year, 94% of Venezuelan exports consisted of petroleum; Brazil's exports were 59% coffee, 9% cotton and 6% cacao; for Sweden the figures were 18% wood pulp, 15% wood, 10% paper and 9% iron ore; and for Australia they were 45% wool, 8% wheat and 4% butter.²⁰ Many other countries could be cited with a much higher degree of commodity concentration than has Canada. Unfortunately, comparisons with more industrialized countries cannot readily be made because of the problem of how to divide exports into categories.

(d) *The Emergence of New Exports*

The decline in the relative importance of some of Canada's traditional exports has been associated not only with the increase of other established lines but also with the emergence of new items which were virtually or totally unknown before the war. Some of the most striking of these cases are found in the mineral field, but other instances are to be found among chemicals and other manufactured commodities.

The most important of the new exports to date, and one of the very important ones for the future, is iron ore. Prior to the war, Canada's exports of iron ore were valued at only a few thousand dollars annually.

¹⁸ W. A. Mackintosh, *op. cit.*, p. 101.

¹⁹ See Chap. 4.

²⁰ International Monetary Fund, *International Financial Statistics*, December 1956.

After the war, the value could be shown in millions, and the inclusion of Newfoundland's exports in the Canadian data further increased it. Nevertheless, in 1950 Canada's iron ore exports were valued at only \$13 million. With the development of the Labrador-Quebec deposit and the increased output from Steep Rock, 1955 exports totalled \$100 million or 2.3% of total domestic exports including gold. In the first 11 months of 1956, iron ore exports totalled \$142 million as compared with \$98 million in the same period of 1955.

The case of crude petroleum is similar to that of iron ore and the potentialities for exports in the future appear to be even greater. In 1928 and 1929 Canada's exports of crude oil averaged less than \$1.5 million. In 1937, and in 1949 and 1950, Canada exported no crude oil whatsoever. By 1955 shipments from the western Canadian fields, developed since 1947, had brought exports to over \$36 million and in the first ten months of 1956 the figure rose to \$84 million.

Associated with the development of petroleum in western Canada has been natural gas. No statistics on natural gas exports are at present carried in *Trade of Canada*, but United States data suggest that they amounted to something more than \$1 million in 1955. While their future may appear uncertain at the time of writing, it is clear that gas exports could be of considerable importance.

Uranium is another mineral which was unknown commercially before the war. By 1955, exports had risen to an estimated \$25 million. The president of Atomic Energy of Canada Limited has forecast that, during the period of the contracts which at the time he spoke ran to March 31, 1962, Canada's uranium production (which is largely for export) would reach the rate of approximately \$300 million per year.²¹

Another commodity contributing significantly to Canada's current exports is synthetic rubber. Production of synthetic rubber was begun under wartime conditions in 1943. While the export data do not show this product separately, it is believed that the figure for exports of chemicals and allied products includes synthetic rubber to the amount of perhaps \$40 million in 1955.

Although the foregoing paragraphs perhaps cover the most striking new Canadian exports, they do not exhaust the list. The D.B.S. noted that by 1955 Canada had assumed prominence in many minerals which did not appear as exports at all in the 1920's, such as molybdenum, titanium ores, cadmium, selenium, magnesium, barite and calcium, and was a potential exporter of such new minerals as lithium oxide, columbium and tantalum.²²

²¹ See Section 21, Part B.

²² D.B.S., *Review of Foreign Trade, Calendar Year, 1955*, p. 44, footnote.

Finally, reference might be made to a number of chemical and other manufactured exports which were non-existent or virtually non-existent before the war. These items include: cellulose products valued at \$14.2 million in 1955; calcium compounds at \$2.8 million; synthetic resins at \$6.1 million; synthetic resin manufactures at \$1.2 million; polystyrene at \$7.0 million; engines and boilers at \$30 million; farm tractors and other vehicles chiefly of iron, excluding automobiles, trucks and parts, at \$10.4 million; guns, rifles and other firearms at \$4.1 million; ships and vessels at \$6.3 million; and aircraft and parts at \$19.9 million. Aluminum exports, which grew from \$9 million in 1928 and \$19 million in 1937 to \$213 million in 1955, should perhaps also be noted here, especially in view of their future growth potential.

III. The Markets

(a) *The Destination of Canada's Exports*

Table 2 indicates the destination of Canada's domestic exports, excluding gold, and shows the changes in the relative importance of major market areas over the years 1928, 1932, 1937, 1954 and 1955. Exports to the various areas are shown for each year as percentages of total domestic merchandise exports, excluding those to Newfoundland. For the prewar period, the percentages are based upon data as published in *Trade of Canada*, except for the application of the wheat adjustment. For 1928 and 1932, the adjustment involves the reduction of exports shown by *Trade of Canada* as going to the United Kingdom and the increase by the same amount of exports going to continental Western Europe. For 1937 all wheat exports are based upon data issued by the Board of Grain Commissioners. As these data are on a volume basis, they have been converted into dollars at prices derived from *Trade of Canada*. For 1954 and 1955, the basic data employed are as published in *Trade of Canada*. The nature of the wheat adjustment is described more fully in Appendix D, which also provides data on exports by destination more finely broken down and covering all of the years 1926 to 1939 and 1946 to 1955.

During the course of the postwar period, there has been a striking increase in the dependence of Canadian exports upon the United States market. In 1947 Canada sold to the United States 38% of its total domestic merchandise exports, a proportion only slightly higher than that in 1928 and 1937. By 1950, the United States share of Canada's export had risen to 65% and, in 1954 and 1955, it was 60%.²³

When adjustment is made for the diversion to the Continent of wheat originally destined for the United Kingdom, the United Kingdom is shown to have been a much less important market and continental Western Europe²⁴

²³ Causal factors behind this increase, and the associated relative decline in exports to overseas countries, are considered in the following chapter.

²⁴ For present purposes "continental Western Europe" is defined as including the Continental member countries of the Organization for European Economic Co-operation, i.e., Austria, Belgium-Luxembourg, Denmark, France, the Federal Republic of Germany, Greece, Italy, the Netherlands, Norway, Portugal, Sweden, Switzerland and Turkey.

Table 2

DESTINATION OF CANADA'S DOMESTIC EXPORTS (a)

(percentages of total domestic exports, excluding gold,
to all countries except Newfoundland)

	1928	1932	1937	1954	1955
United States.....	36.3	32.8	36.2	59.7	59.8
Other Western Hemisphere (b)...	2.9	2.0	3.7	5.0	4.0
United Kingdom.....	21.8	31.1	37.6	16.8	18.0
Australia, New Zealand, Union of South Africa.....	3.2	3.1	6.1	2.6	3.2
Rest of sterling area (c).....	3.4	3.8	3.5	2.7	2.7
Continental Western Europe (d)	26.3	19.8	8.6	8.5	8.4
Overseas territories of continen- tal Western Europe (e).....	0.4	2.4	0.5	0.4	0.3
Japan.....	2.9	2.5	2.5	2.5	2.1
U.S.S.R., Eastern Europe, mainland China (f).....	1.7	1.9	0.6	0.2	0.3
All other countries (g).....	1.1	0.8	0.7	1.5	1.2
Total	100.0	100.0	100.0	100.0	100.0

(a) Based upon data published by the D.B.S. in *Trade of Canada*, adjusted to reflect (a) diversion to the Continent of wheat originally destined to the United Kingdom in 1928 and 1932, and (b) Board of Grain Commissioners' data for wheat exports in 1937. (See Appendix D.)

(b) Excludes Newfoundland, sterling area territories and overseas territories of Western European countries.

(c) Countries at present in the sterling area.

(d) Continental members of the O.E.E.C., including all Germany in 1928, 1932 and 1937.

(e) Currently associated territories. Excludes Spanish territories.

(f) Includes all China and excludes Eastern Germany in 1928, 1932 and 1937.

(g) Excludes Newfoundland.

much more important in the late 1920's than would appear from the data in *Trade of Canada*. Thus, for 1928 the trade data show the United Kingdom as taking about 33.5% of Canada's total domestic merchandise exports and continental Western Europe about 14.5%. When the wheat adjustment is made, the share going to the United Kingdom becomes 22% and that to continental Western Europe 26%. In the 1930's such factors as the Commonwealth preferential arrangements and the increase of protectionism on the Continent brought marked changes in Canada's export pattern. Thus, the share of Canada's domestic merchandise exports going to the United Kingdom rose from 22% in 1928 to almost 38% in 1937. Meanwhile, the share to the Continent fell from 26% to less than 9%. Since the war, the percentage of Canada's exports taken by the United Kingdom has fallen sharply, to 17% in 1954 and 18% in 1955. Postwar exports to the Continent have fluctuated between 12% of the total in 1946 and 6% in 1950. In each of the years 1953 to 1955, however, the Continental share appeared to have settled close to its 1937 levels. The most important Continental markets in recent years have been the Federal Republic of Germany (with 2.1% of 1955 total exports), Belgium-Luxembourg, the Netherlands, Norway and France.

All other destinations have accounted for approximately 15% of Canada's exports in each of the years considered in Table 2. Australia, New Zealand and the Union of South Africa, taken together, almost doubled in importance between 1928 or 1932 and 1937, when they accounted for 6% of the total. By 1954 and 1955, however, they had declined to about the importance which they held before the Ottawa Agreements of 1932. Exports to other members of the sterling area — of which India and the British West Indies have been most important — showed little relative increase between 1928 and 1937, and a moderate decline in importance between 1937 and 1955. The Japanese market recovered rapidly between 1950 and 1953, when it took almost 3% of Canada's exports. At about 2% of the total in 1955, however, these exports were of less relative importance than they had been in 1928 or 1937. The importance of exports to the U.S.S.R., Eastern Europe and mainland China fell sharply during the 1930's and, after an initial postwar upsurge, were negligible in the period 1951 to 1953. In the first half of 1956, however, exports of wheat to the U.S.S.R., Poland and Czechoslovakia raised the share of this group of countries to almost 2% of Canada's total exports. The other countries of the Western Hemisphere and all other countries as a group were generally more important markets for Canada's exports in 1954 and 1955 than they had been in the prewar years shown in the table. The most important of these other markets in 1955 were Mexico, Venezuela, Colombia, the Philippine Republic, Cuba and Brazil.

(b) *The Commodities Going to Major Markets*

In recent years *the United States* has been the largest market for most of Canada's major exports. Considering the commodities in Table 1, the United States accounted for over 80% of Canada's 1955 exports of meats and newsprint, and may be considered as accounting for all of the gold; for between 70% and 80% of exports of fish and fishery products, lumber, wood pulp, and iron ore; and for over 50% of the export of asbestos, nickel, zinc, chemicals and sundry manufactures (with over 80% of such items as alcoholic beverages, farm implements and machinery, and aircraft and parts). Further, the United States took 30% to 50% of Canada's domestic exports of coarse grains, aluminum, copper, and lead. Among major exports, the United States market was unimportant only for wheat and wheat flour, and for automobiles, trucks and parts.

The large share of Canada's forest products exports taken by the United States in 1955 meant that these commodities as a whole accounted for about 48% of Canada's domestic merchandise exports to the United States. This percentage was almost the same as in 1937, although between 1937 and 1955 there had been a relative drop in the importance of newsprint — from 29% to 23% — and an increase in the importance of lumber. Exports of minerals to the United States, however, have increased in importance over the prewar period. In 1937 asbestos, aluminum, copper, lead, nickel,

zinc and iron ore accounted for about 12% of Canada's exports to the United States. In 1955 these commodities made up 20% of the total. Offsetting this change, and some increases in the importance of other items, was a decline in the role of exports of certain agricultural commodities and other items such as alcoholic beverages.

Despite the decline in its share of Canada's total exports, the *United Kingdom* in 1955 was still the most important export market for a number of important commodities. In that year it took between 40% and 50% of total exports of wheat and wheat flour, coarse grains, and aluminum. It also took over 25% of the exports of copper, lead and zinc. Exports to the United Kingdom, however, are heavily concentrated in a few items. In 1955, 22% was accounted for by wheat and wheat flour; 6% by coarse grains; 18% by lumber, wood pulp and newsprint; and 32% by asbestos, aluminum, copper, lead, nickel, zinc and iron ore. These items thus made up over three-quarters of total shipments to the United Kingdom. In all cases except those of wheat and flour, copper, lead and nickel — where there were modest declines — the importance of these items in the total increased between 1937 and 1955. The most notable decline occurred in exports of meats, which fell from 9% of the total going to the United Kingdom in 1937 to a negligible figure in 1955.

As a group, the countries of *Continental Western Europe* in 1955 provided a market for Canada's exports slightly less than half as important as the United Kingdom. Of these exports, 93% went to seven countries — Belgium-Luxembourg, France, the Federal Republic of Germany, Italy, the Netherlands, Norway and Switzerland. The following comments relate to trade with the seven major markets. In general, the United Kingdom was a significantly more important market than were those Continental countries taken together for wheat, coarse grains, forest products and base metals. The Continental countries, however, provided larger markets for Canada's exports of seeds, meats, fish, asbestos and such manufactured items as alcoholic beverages; farm implements and machinery; non-farm machinery; engines and boilers; automobiles, trucks and parts; other vehicles, chiefly of iron; and chemicals, including synthetic rubber. In general, the seven Continental countries far from dominated the markets in these commodities. They did, however, take 42% of Canada's 1955 exports of seeds, about 24% of the chemicals (excluding fertilizers and uranium) and 22% of the wheat and wheat flour. Other items where they took between 10% and 20% of Canada's 1955 exports were, in descending order of the share taken, lead, copper, asbestos, other vehicles chiefly of iron, nickel, coarse grains and pulpwood.

Considering Canada's total exports to the seven major Continental markets, 27% of the 1955 total consisted of wheat and wheat flour, 6% of seeds and 3.5% of barley, oats and rye. The major forest product items — lumber, pulpwood, wood pulp and newsprint — made up less than 8%;

but asbestos, aluminum, copper, lead, nickel, zinc, and iron ore accounted for 30%. Apart from chemicals, which accounted for 9% of the total, manufactured items were relatively unimportant in the total picture. The major change from 1937 was the decline in the relative importance of wheat and wheat flour, which in that year accounted for 48.5% of Canada's exports to the seven Continental countries. The metals and minerals listed above also declined somewhat in relative importance, from 34% in 1937 to 30% in 1955. The major movements within this group were declines in the relative importance of zinc and copper and an increase in the importance of aluminum. Other exports generally increased in importance. Chemicals and seeds rose from negligible amounts in 1937 to 9% and 6% of the 1955 total, respectively. The four major forest product items grew from 3% to 8%, and a number of manufactures — alcoholic beverages, farm implements and machinery, non-farm machinery, engines and boilers, automobiles and other vehicles — increased from about 0.5% to 2.5% of the total.

Although Canada's exports of automobiles, trucks and parts to *Australia, New Zealand and the Union of South Africa* have not kept pace with the growth in total exports in the postwar period, these three countries still account for the bulk of Canada's automobile exports. Indeed, the percentage going to these destinations has increased from 62 in 1937 to 78 in 1955. In trade with Australia, automobiles, trucks and parts accounted for 26% of total Canadian exports in 1955. For New Zealand, they accounted for 18.5% and, for the Union of South Africa, for 21%. In each case, automobiles made up a smaller proportion of total exports to these countries than they did in 1937, but, in the cases of Australia and the Union of South Africa, the relative declines were small.

Canada's 1955 exports to Australia were heavily concentrated on six commodities. In addition to automobiles, trucks and parts, these were lumber accounting for 20%, newsprint accounting for 15%, asbestos for 6%, aluminum for 8%, and copper for 5%. These six commodities thus made up 80% of the trade.

After automobiles, trucks and parts which accounted for 18.5% of Canada's 1955 exports to New Zealand, the most important items were newsprint at 17% and other paper at 5.5%. The development of facilities in New Zealand, however, may be expected to decrease these exports and perhaps also those to Australia. In the first ten months of 1956, exports of newsprint accounted for 11% of Canada's total sales to New Zealand and other paper for 3.5%. Other relatively important items in Canada's 1955 exports to New Zealand were fish and products and lumber at 8% each, copper at 6%, and non-farm machinery at 4%.

For the Union of South Africa, lumber exports at 22% of the total slightly exceeded exports of automobiles, trucks and parts at 21% in 1955. Next in importance were wheat and flour at 16% of the total, newsprint

at 7%, and chemicals at 5%. These five commodities thus aggregated 71% of Canada's 1955 exports to the Union.

In recent years a large proportion of Canada's exports to *Japan* have consisted of wheat, wheat flour and barley. In 1955, wheat and wheat flour accounted for 59.5% of the total, and barley for 6%. This contrasts with 1937 when these exports aggregated 8% of Canada's sales. Other important exports to Japan in 1955 were wood pulp at 6% of the total, as compared with 13% in 1937; iron ore at 4%, as compared with no exports in 1937; asbestos at 3%, as compared with 5%; and chemicals other than fertilizers at 2.5%, as compared with a negligible quantity in 1937. In 1937 aluminum, copper, lead, nickel and zinc made up 53% of Canada's exports to Japan, while in 1955 they accounted for less than 0.5%.

As has been noted, most of the increased exports to the *U.S.S.R., Eastern Europe and mainland China* in the first half of 1956 was accounted for by sales of wheat to the *U.S.S.R.*, Poland and Czechoslovakia, although other commodities such as rye to Poland, barley to Czechoslovakia and butter to Eastern Germany, have been of some importance. As in the first half of 1955, exports to mainland China consisted largely of fertilizers, but at \$438,000 were less than half the value in the first half of 1955.²⁵

Among other important markets, 33% of *Venezuela's* imports from Canada in 1955 consisted of wheat and wheat flour. Next in importance was milk and its products at 17%, followed by chemicals at 8% and non-farm machinery at 5%. Exports to *Brazil* were down sharply in 1955. In the previous year, 31% of the larger total consisted of wheat and wheat flour, 11% of farm machinery, 11% of electrical apparatus, 8% of copper, 8% of non-farm machinery, and about 5% each of aluminum, asbestos and newsprint. These eight items aggregated 83% of the total.

The variable nature of the trade with *India* is indicated by the fact that engines and boilers (largely diesel locomotives) were less than 1% in 1952 and 1953, and 45% of total exports in 1955. On the other hand, wheat and wheat flour made up about 70% of the total in 1952 and 1953 and fell to under 2.5% in 1955. Other important items in 1955 were electrical apparatus, newsprint, and aluminum at about 8% each, and copper at 6%.

Among Canada's 1955 exports to the *British West Indies*, wheat and wheat flour accounted for 26%; fish and fishery products for 17%; meat for 5.5%; and textiles and products, tobacco and products, and lumber for between 4% and 5%.

(c) *The Distribution of Exports and the Balance of Payments*

Despite the concentration of exports upon the United States, imports are even more highly concentrated on that country and Canada continues

²⁵ Considering the first 11 months of 1956, exports to the group of countries were 1.5% of total domestic exports as compared with almost 2% in the first half of the year. Fertilizer exports to China, however, were up sharply — \$2.4 million in the period January–October, 1956, or more than double the value in the same months of 1955.

to run a substantial deficit on merchandise trade account with the United States. Between 1951 and 1955, this deficit varied between \$445 million and \$682 million, on the basis of data adjusted for balance of payments purposes. While substantial, the deficit between 1951 and 1955 was well below the level of \$890 million in 1947. In addition to the deficit on merchandise trade account, Canada also runs a deficit with the United States in respect of current invisible transactions — a deficit which has risen since the years immediately following the war. The total current account deficit, taking into account new gold production available for export, declined from \$1,134 million in 1948 to \$400 million in 1950, then rose to over \$900 million in 1951 and 1953 and to \$1,041 million in 1955. For 1956 it is expected that this deficit will have exceeded the previous peak established in 1947. The increase in exports to the United States has meant, however, that the current account deficit with that country in each year from 1948 to 1955 has been a smaller proportion of total current account payments to the United States than it was in the years 1946 and 1947 or in the period 1927 to 1932. In 1955, the deficit was 22% of total current payments, as compared with 40% in 1947, 29% in 1928 and 33% in 1929.

Canada's current account deficit with the United States is financed partly by net current earnings from overseas countries and, more important in recent years, by the inflow of capital into Canada, especially from United States. Although the relative shift in Canada's exports toward the United States has meant a reduction in Canada's current account surplus with overseas countries, this overseas surplus still made possible the financing of \$349 million of the \$1,041 million deficit with the United States in 1955. The balance of that deficit was financed as follows: \$363 million from capital inflow from the United States, \$287 million from capital inflow from overseas countries and \$42 million from a reduction in Canada's official holdings of gold and United States dollars.²⁶

Much has been made of the prewar triangular pattern of settlements under which Canada's net surplus with overseas countries was used to meet all or part of the deficit with the United States. If, as is done by the D.B.S. in its balance of payments work, account is taken of the diversion to other countries of wheat originally destined to the United Kingdom, the current overseas surplus was earned largely in transactions with countries other than the United Kingdom in the period 1926 to 1935. Indeed, in each of the years 1927 to 1932, inclusive, Canada had a current account deficit with the United Kingdom.²⁷ For the period 1936 to 1939, the current surplus with the United Kingdom was slightly larger than that with all other overseas countries.

From 1927 to 1932, the current account surplus with overseas countries, offset to a small extent by capital movements, covered part of the current

²⁶ Data on Canada's 1955 balance of payments are subject to revision. See Appendix B.

²⁷ In addition, the net capital movement was from Canada to the United Kingdom in each of these years.

account deficit with the United States. The balance was covered by a substantial inflow of United States capital, the use of Canada's holdings of monetary gold and changes in the external assets of Canadian banks. From 1933 to 1939, the overseas current surplus — with capital movements making little net contribution over the period — was sufficient to cover both the current account deficit with the United States and to provide for a substantial export of capital to that country, in considerable measure through the repatriation of United States investment in Canada. In addition, for part of the period at least, the overseas surplus enabled an increase in the external assets of Canadian banks and in Canada's monetary gold holdings.

To some extent, the war and the dollar shortages and resulting exchange and trade restrictions of overseas countries made more difficult the maintenance of this triangular pattern of settlement. Yet, throughout the postwar period, in spite of overseas exchange difficulties and in spite of Canadian lending abroad, very substantial amounts have been received in overseas settlements. The overseas current account surplus, net of the amount which was financed by Canadian lending, has decreased in recent years; at the same time, however, there was an increase in the inflow of capital to Canada from overseas countries. From 1946 to 1955, total overseas settlements (the net result of both current and capital transactions) aggregated \$5.8 billion as compared with current deficits with the United States totalling \$7.7 billion. The balance of about \$1.9 billion, plus an increase of about \$500 million in Canada's official holdings of gold and United States dollars, was covered by the inflow of United States capital. As has been noted above, even in 1955, Canada's receipts from overseas resulting from current and capital transactions covered three-fifths of the current deficit with the United States.

It might be assumed that among the profound effects of the war and the postwar exchange problems upon the Canadian balance of payments has been the virtual destruction of the prewar triangular pattern of settlement under which exchange transfers from overseas were used in the settlement of Canada's deficit with the United States. It is true that the proportion of exports going to the United States has increased more rapidly than the proportion of imports coming from that country, the latter proportion being already much higher in the prewar period. Thus the trade basis of the triangular settlement pattern has narrowed. Yet the foregoing paragraph has suggested that transfers from overseas have continued to be very important in the postwar period. On the basis of various comparisons, it would appear that total exchange receipts from overseas are only moderately less important in the Canadian balance of payments than they were in the late 1920's, although their significance has decreased more markedly in comparison with the late 1930's. The basic structure of the Canadian balance of payments in this regard has not altered and triangular settlements remain of considerable importance, although increasingly based upon an inflow of overseas capital.

(d) Other Consequences of the Export Distribution

The concentration of Canada's exports on one market is much heavier than that which occurs in any other of the first ten leading exporting countries.²⁸ Calculations presented by the D.B.S. for the period up to 1953 show a very much heavier concentration of domestic exports for Canada than for the United States and the United Kingdom.²⁹ But, while Canada's exports show a heavier concentration on one market than do those of the other largest exporting countries, it is to be noted that Ireland and New Zealand both sell a larger proportion of their exports to the United Kingdom than Canada does to the United States. Similarly, the exports of certain Latin American countries are more heavily concentrated on the United States than are those of Canada.³⁰

An obvious consequence of the distribution of exports is the dependence of the Canadian economy upon the United States market. Sixty per cent of Canada's 1955 domestic merchandise exports went to the United States, and, as was noted in Subsection III (b), for many products the percentage is much higher. For a number of these items, a high percentage of total production is exported, and the continuation of United States purchases is vital to the maintenance of the level of activity of the Canadian industry. In newsprint, for example, the United States took about 81% of Canada's 1955 production.³¹ In nickel, United States purchases accounted for 66% of production, in iron ore they were 64% and in the case of whisky it would appear that 1955 exports to the United States accounted for about 64% of Canadian sales outside the distilling industry.³²

As regards the over-all importance of the United States market to the Canadian economy, in 1955 merchandise exports to that country were almost 10% of G.N.P. (or G.N.E.) and exports of goods and services to the United States almost 14% of G.N.P. Unlike exports to all countries, the significance of exports to the United States relative to G.N.P. has not declined in comparison with the prewar period.

The heavy concentration of Canada's exports on one market implies certain dangers. In the postwar period, however, the United States has provided not only the world's largest import market but also one of the most buoyant. The remarkable shift in the destination of Canada's exports

²⁸ International Monetary Fund, *International Financial Statistics*, December 1956. According to the data published by the Fund, the ten leading exporters in 1955 were the United States, the United Kingdom, the Federal Republic of Germany, France, Canada, Belgium-Luxembourg, the Netherlands, Japan, Venezuela, and Italy.

²⁹ D.B.S., *Review of Foreign Trade, Calendar Year, 1953*, pp. 13 and 43-44.

³⁰ Statistical Office of the United Nations, International Monetary Fund, and International Bank for Reconstruction and Development, *Direction of International Trade*, Annual Issue—Annual Data for the years 1938-1948 and 1952-1955.

³¹ Canadian Pulp and Paper Association, *Submission to Royal Commission on Canada's Economic Prospects*, Montreal, January 1956, p. 53.

³² Data presented in Part B of this study.

between 1947 and 1950 must be explained in terms of the United States need and ability to pay for these goods in comparison with the need and ability to pay in overseas countries. There has been no practicable alternative to increasing the share of exports going to the United States. Even with the shift which has occurred, Canada still exports less to the United States than she imports from that country and exports more overseas than she imports.

It has been suggested that the higher proportion of exports going to the United States does not imply as much vulnerability as it used to. The goods produced by Canada's basic industries, particularly minerals and forest products, are in general demand, and the United States depends more on Canadian supplies than was formerly the case. Although Canada is still a marginal supplier of many products, the developing materials shortage in the United States has increased United States dependence upon imports — and its dependence upon imports from Canada. For such commodities as newsprint, asbestos, and nickel, the United States supply available for consumption in large measure depends upon Canada. For others, such as petroleum, uranium and iron ore, the United States is turning increasingly to Canada as rich domestic deposits are exhausted and the costs of obtaining additional supplies are increased. Nor are Canadian supplies necessarily marginal supplies. In many cases United States consumers of basic materials now have interests in Canadian sources of supply, or Canadian sources have important regional advantages, so that they could not readily be displaced. While Canada is vulnerable to the effects of a decline in United States activity, so also is the total of world trade and it does not follow that Canada would be any less affected by a United States recession if her trade were less concentrated on that country.³³

Although total United States imports in 1953, 1954 and 1955 were only 3% of United States G.N.P., Canada provided 23% of these imports in each year.³⁴ In 1955, United States imports from Canada exceeded those from the whole of Western Europe by 11% and were 80% of those from the whole of Latin America.³⁵ No country is better able to take advantage of growing United States demand than is Canada. Postwar Canadian development has been profoundly influenced by increasing United States demand for basic products. The growing demand for mineral and wood products — in considerable measure United States demand — has been one of the great dynamic influences in the rapid postwar growth of the Canadian economy.³⁶

³³ See J. Douglas Gibson, "The Changing Influence of the United States on the Canadian Economy", Presidential Address at the Annual Meeting of the Canadian Political Science Association, Montreal, June 7, 1956, *The Canadian Journal of Economics and Political Science*, November 1956, especially pp. 423–425.

³⁴ U.S. Department of Commerce, *Survey of Current Business*, June and July, 1956; and International Monetary Fund, *International Financial Statistics*, December 1956.

³⁵ U.S. Department of Commerce, *Foreign Commerce Weekly*, April 30, 1956, p. 14.

³⁶ J. Douglas Gibson, *op. cit.*, p. 423.

Despite the concentration of many exports upon United States, overseas countries still dominate the market for a number of items including some very important ones. Thus in 1955 overseas countries took 97% of Canada's exports of wheat and wheat flour and 96% of her exports of automobiles, trucks and parts. Overseas markets also accounted for between 60% and 70% of 1955 exports of coarse grains, aluminum, non-farm machinery, chemicals (including synthetic rubber but excluding fertilizers and uranium), engines and boilers, and electrical apparatus. In addition, over half of the 1955 exports of copper and lead went overseas.

The United Kingdom market was important for each of the non-manufactured items mentioned above, taking 40% of total exports of wheat and flour, 48% of the coarse grains, 47% of the aluminum, 30% of the copper and 35% of the lead. Despite the fact that the share of Canada's exports going to the United Kingdom has declined so markedly, Canada was the United Kingdom's most important import source in 1953 and second to the United States in 1954 and 1955. In 1955 Canada supplied 9% of United Kingdom imports, as compared with 11% from the United States and 7% from Australia. In some less important items, the United Kingdom market is dominant, accounting for over 80% of Canada's 1955 exports of oil cake and meal, unmanufactured tobacco, squirrel skins, cheese, pit props, Douglas fir railroad ties, match splints, and cobalt oxides and salts.

In such commodities as coarse grains, aluminum, chemicals and certain manufactures, the importance of overseas markets has not prevented exports from increasing more rapidly than the average rate for all Canadian exports. It is of interest, however, that the two major items in which Canada depends almost entirely on overseas markets for her exports — wheat and flour, and automobiles, trucks and parts — have both fared badly relatively to total exports, so that their percentage of the total has decreased significantly since the prewar period. In the case of other commodities, an increase in exports to the United States has offset a decline in overseas shipments in greater or less degree. Thus, in the case of meats which fell from 3.5% of total Canadian exports in 1937 to 0.9% in 1955, the decline would have been much greater had not the share of the United States in an almost unchanged export value risen from 10% to 86%.

Throughout the postwar period, Canada's total exports to the United States have exhibited both greater growth and a much steadier movement (upward) than have her exports either to the United Kingdom or to all other overseas countries. From 1946 to 1955, Canada's domestic merchandise exports to the United States about tripled in value. Only once, from 1953 to 1954, did they show a decline in value and, in that period, the decline was smaller absolutely than the drop in exports to overseas countries. Over the same period, exports to the United Kingdom and other overseas countries fluctuated widely and increased in value by only 22% and 18%, respectively.

DETERMINANTS OF CANADA'S EXPORTS

HAVING reviewed the nature and significance of Canada's commodity exports in the first chapter, it would seem appropriate to consider the major factors which influence the size of the export movement. No mathematical causal relationships are suggested and the determining factors are not analyzed in detail. The purpose of the chapter is rather to set out briefly, in Section I, the main determinants of Canada's exports to all countries and to examine, in Section II, the factors contributing to the substantial postwar shift in the direction of these exports.

I. Exports to all Destinations

(a) Canada's Share of World Trade

To some degree, Canada's exports fluctuate over time with world exports and respond to the same forces which affect the world total. The level of world trade gives some indication of the total demand for imports, within which is the demand for those goods which Canada can supply. Special factors, however, operate on the trade of each country and it cannot be said that Canada's exports are in any precise sense determined by the level of world trade. Thus, while the United States dollar value of the total exports of all countries outside the Soviet bloc had by 1955 increased to almost three and one-half times its 1937 level, the value of Canada's exports on the same basis went up to almost four and one-half times the prewar figure.¹ Data published by the United Nations suggest that the increase in the value of Canada's exports in relation to the world total was due in large measure to a more rapid growth in the volume of Canadian exports. Canada's export

¹ International Monetary Fund, *International Financial Statistics*, December 1956; and D.B.S., *Trade of Canada*, 1954, Vol. I. Canadian data (domestic merchandise exports plus re-exports) are adjusted for comparability by the Fund to include freight and insurance to the border and (in 1955) defence equipment or supplies. The 1937 data published by the Fund also include exports of Newfoundland, but a further adjustment has here been made (on the basis of data published in *Trade of Canada*) to exclude trade between Canada and Newfoundland. Here, as elsewhere in this study, world totals exclude the exports of the U.S.S.R., Albania, Bulgaria, Czechoslovakia, Eastern Germany, Hungary, Poland, Rumania, mainland China, and other Asian areas.

prices appear to have increased only slightly more rapidly than the world average while the relative increase in the Canadian quantum index was considerably more rapid.²

As a result of this growth, Canada's share of world exports rose from 4.4% in 1937 to 5.7% in 1955. In 1952 Canada shipped 6.5% of total exports but, since that time, relative increases by the Federal Republic of Germany, France, Belgium-Luxembourg, the Netherlands, Japan, Venezuela, Italy and other smaller exporters have accompanied the decline in Canada's share. The share of the United States also dropped, from 20.6% in 1952 to 18.5% in 1955, and relative declines were also experienced by the United Kingdom and Australia. Canada dropped from third place among the world's exporters in 1952 to fifth in 1955, when Canadian exports were exceeded by those of the United States, the United Kingdom, the Federal Republic of Germany, and (very slightly) by those of France.³

(b) The Level of Activity in Other Countries

Other things being equal, demand for the goods which can be supplied by Canada is dependent in part upon the level of activity and incomes in export markets. The higher the incomes, the greater will tend to be the demand for imports. It is true that the nature of the activity affects the distribution of demand among commodities and thus among supplying countries, as well as its over-all size. Further, the demand is limited by the restrictions imposed by importing countries, imposed in some cases in order to limit imports to the amount consistent with the country's ability to pay out foreign exchange. Nevertheless, the level of activity (or incomes) in other countries remains an important basic determinant of the level of Canada's exports.

The high concentration of Canada's exports on the United States means that, to a very great extent, they are directly affected by the level and nature of United States economic activity. As seen in the preceding chapter, this concentration has increased markedly since the prewar and early postwar periods. On the other hand, it may also be suggested that increased United States dependence upon Canadian supplies has reduced the marginal character of many imports from Canada, making them less subject to exaggerated swings in the face of moderate fluctuations in the level of United States activity. While imports remain relatively unimportant in the total United States economic scene, there has been a relative shift away from silk and other fibres, tin and natural rubber to such commodities as forest products and metals and minerals of a kind supplied by Canada. The United States now depends upon imports for a large share of its consumption of many basic materials, with a substantial proportion of these imports coming from Canada.

² United Nations, *Statistical Yearbook, 1955*, and *Monthly Bulletin of Statistics*, September 1956; Bank of Canada, *Statistical Summary*, 1950 Supplement and April 1956. Price indexes are converted to U.S. dollars.

³ International Monetary Fund, *op. cit.*; and D.B.S., *op. cit.* In the first nine months of 1956, Canada's exports exceeded those of France.

Activity in the United States has such an important bearing on world trade as a whole that it influences all of Canada's exports and not just the substantial proportion sold to the United States. Although imports amount to only about 3% of United States G.N.P., the United States is the world's largest importer with 14% of the world total in 1955.⁴ In addition, other United States payments abroad — including military expenditures, government grants, and private capital movements — greatly affect the ability of the rest of the world to purchase imports. The total of these United States payments reflects other influences as well as the level of American activity and incomes. Nevertheless, Canada's ability to export to overseas countries in excess of the amounts purchased from them rests, in considerable measure, on the fact of there being net out-payments in the total foreign transactions of the United States and on the support given to gold mining by United States Treasury purchasing policy.

The influence of United States activity on world trade is undoubtedly very great, although recent movements have not exhibited much close parallelism. In particular, established notions of the character of the influence were shaken when the total value of world trade (imports) rose by 4% between 1953 and 1954, despite a 1% decline in United States G.N.P. and a 6% decline in United States imports.⁵ In general, Canada's total exports have tended to move with United States G.N.P., although they have experienced relatively wider fluctuations. Movements of Canadian G.N.P., however, have more closely paralleled those of the United States series than have movements of total Canadian exports. The interrelationships between the various series are complex and generalization about causal influence would be both difficult and dangerous.

Even less precise is the relationship between the level of incomes in overseas countries and their purchases of Canada's exports. Incomes abroad are subject to some of the same influences and are affected by those in the United States. Yet they do move independently to some degree and constitute an important basic influence in the determination of Canada's exports. It was noted in Chapter I that, despite the changes which have taken place, Canada continues to depend on markets outside the United States for most of her exports of a number of important commodities — such commodities as wheat and wheat flour, coarse grains, aluminum, copper, lead and such manufactures as automobiles. In general, the demand for imports will not only be affected by the level of real income in a country but will tend to be greater to the extent that conditions are inflationary relative to those elsewhere. The demand generated by the level of activity and incomes may, however, be limited by restrictions. Where relative inflation exists, balance of payments considerations may mean that the amount of potential demand choked off by restrictions is especially large.

⁴ See Chap. 3, Section III (a).

⁵ International Monetary Fund, *International Financial Statistics*, December 1956; and U.S. Department of Commerce, *Survey of Current Business*, July 1956.

(c) Restrictions Affecting Imports

In the preceding subsection it has been noted that between the potential demand for Canada's exports, in part dependent upon the level of activity in other countries, and actual purchases of these exports stand the restrictive systems of importing countries. Tariffs and trade and exchange restrictions have obvious effects upon the volumes in which Canadian goods can be exported.

In general, Canada's exports of manufactured and more highly processed goods face greater barriers than do the basic staple exports. The United States grants duty-free treatment to two major primary "manufactures", wood pulp and newsprint, and to the commodities used in agriculture, fertilizers and farm machinery. Otherwise, however, United States tariffs tend to be higher for more highly processed commodities. This, together with the efficiency of United States manufacturing industry and special factors such as parent-subsidiary relations, means both that manufactures other than primary items are relatively unimportant among Canada's exports to the United States and that, for many manufactured exports, the bulk of the Canadian market is found outside the United States. Thus, it is estimated that less than 33% of Canada's 1955 exports of chemicals and allied products, other than fertilizers and uranium, went to the United States. While 56% of the exports of the items grouped as "sundry manufactures" in Chapter 1 went to the United States in 1955, the removal of alcoholic beverages and farm machinery and implements from the group reduces the United States share to 37%.

Canada's manufactured exports have benefited from preferential tariff treatment within the Commonwealth, but the benefits from this have been reduced by negotiated reductions of preferential margins, by the effects of price increases on specific margins, and by the application of trade and exchange restrictions, often discriminating against Canada as a hard currency supplier. Between 1937 and 1955, United Kingdom imports of "sundry manufactures" from Canada declined from \$20 million to \$5 million. Over the same period, United Kingdom purchases of refined nickel from Canada fell sharply in both volume and value, although this was partially offset in volume and much more than offset in value by purchases in less refined form. Yet Commonwealth markets remain important; in 1955, 78% of Canada's exports of automobiles, trucks and parts still went to Australia, New Zealand and the Union of South Africa.

As regards overseas markets generally, it is often difficult to isolate the roles of protectionism and of balance of payments considerations in explaining the restrictive systems. Restrictions undertaken for balance of payments purposes have a protective effect and the commodities chosen for most severe limitation include those which are or can be produced locally. Thus, balance of payments restrictions generally bear more heavily on more highly pro-

cessed goods. Further, as balance of payments difficulties ease, restrictions on manufactures may tend to be retained for their protective effects, while those on basic materials are relaxed to obtain the obvious benefits to efficiency and competitiveness from buying in the cheapest markets. Despite this situation, however, countries other than the United States and the United Kingdom account for substantial proportions of Canada's exports of primary iron and steel, chemicals and various other manufactures. Although limited by restrictions below what they might otherwise be, manufactures bulk more important in Canada's exports to these countries than in the total export picture.

Agricultural commodities also face protection through tariffs, quotas and the subsidization of domestic production. Indeed, agriculture has become the subject of special regimes in the economic policy of many countries. Both in the United States and in Western Europe, special restrictions have been erected to protect domestic production against foreign competition.⁶ While the value of Canada's exports of agricultural commodities has remained great, protectionism plus the relatively slow growth of demand in traditional markets has meant that exports of agricultural and animal products actually fell in volume between 1928 and 1955.⁷

Canada's basic exports of forest products and metals and minerals face relatively low restrictions. Further, the demand for these commodities has been such that they have moved overseas despite the existence of restrictive systems of considerable severity. Where such goods were subject to administrative restrictions they were often bought in quantity, so that the removal of restrictions or discrimination has had less apparent effect than might have been expected in the light of the nature of the balance of payments problems and general restrictive systems which had existed.⁸ As regards exports to the United States, some of the most important, such as wood pulp, standard newsprint, unmanufactured asbestos, primary copper, nickel matte and oxide and iron ore, are duty-free. Others, including lumber, aluminum and refined nickel, move in large volume despite the existence of moderate duties.

(d) Export Promotion and Other Protectionist Devices

A number of Canada's exports compete with goods sold under subsidy arrangements of various types. Export incentives may involve direct payments to exporters, the remission of taxes, retention quotas under which the exporter is allowed to retain for his own use or disposal a portion of his foreign exchange earnings, favourable export rates under multiple currency systems or other devices. Exporters may benefit through insurance arrangements covering payment and convertibility risks, or through the use

⁶ See Chap. 3.

⁷ See Chap. 4, Section IV (a).

⁸ It is relevant that, in the early postwar period, the Canadian government extended large loans to overseas countries for the purchase of Canadian exports.

of the proceeds of tied governmental loans, *i.e.*, loans which must be spent in the lending country. Agricultural surpluses are sold at less than cost or for inconvertible local currency, and it is reported that the United States surplus disposal programme involves commitments for future purchases of United States agricultural commodities.⁹ Particularly among soft currency countries, bilateral or regional arrangements involve the exchange of relatively favourable treatment for the exports of partner countries. Such arrangements may also promote exports by the granting of credit facilities, as through swing margins in payments agreements and European Payments Union credit facilities.

Devices such as those mentioned in the preceding paragraph have been important. Outside of the disposal of surplus agricultural commodities, however, their over-all effect upon Canadian exports has probably not been great. Such a judgment must, of course, be taken in the light of the basic balance of payments positions of the countries employing or benefiting from the devices. Export promotion devices have often had their basis in a relatively high price structure in the exporting country which might have been corrected by a currency devaluation, although such a step was not deemed wise. In short, they represented a partial effective devaluation. The capacity of soft currency importers to increase dollar purchases under any acceptable arrangements was limited in view of their basic balance of payments positions. As balance of payments conditions have improved, reliance on such export promotion techniques has decreased and trade has become less subject to restriction and discrimination, especially outside the fields of agricultural and manufactured commodities where domestic protectionist pressures are most important.

Canada's exports must also compete with goods produced with governmental assistance in customer countries. Domestic subsidies to agriculture have already been mentioned. In addition, the development of facilities may be encouraged through accelerated depreciation provisions in the tax regulations, as in the cases of newsprint and aluminum production in the United States. Further, the United States Government constructed facilities during the war for the production of aluminum and synthetic rubber. Large United States public funds have also been invested in the development of Cuban nickel deposits.

(e) Canadian Policy

The Canadian Government, in its turn, has encouraged exports through some of the techniques noted in the preceding subsection. Special tax concessions to mining, contracts enabling the write-off of uranium mining and milling facilities, and government wartime construction of the synthetic rubber plant have all contributed to the development of export industries. Exports have also been aided by export credits insurance, by tied loans and

⁹ See Chap. 3, Section III (a).

requirements for cash purchases in Canada in the early postwar period, by grants under the Colombo Plan and by some bilateral trade agreements. Under these agreements, Canada has obtained the easing of dollar import restrictions on salt cod by Spain and Portugal, the removal of discrimination in the Japanese import licensing of some important export commodities, and a commitment by the U.S.S.R. to buy specified quantities of wheat. In exchange, Canada has granted most favoured nation treatment to the partner countries and, in the cases of Spain and Portugal, some m.f.n. tariff concessions. In the past, there was the application of provincial measures which stimulated the "up-grading" of exports from pulpwood to wood pulp and newsprint.

Of more fundamental importance has been government policy in its broader aspects, a policy which has tended to create a favourable environment for exports. The relatively liberal Canadian commercial policy has led other countries to treat imports from Canada more liberally than might otherwise have been the case. Not only has Canada obtained m.f.n. tariff reductions by customer countries in return for Canadian concessions, but in addition, other countries have been more willing to grant entry to Canadian goods through their quota systems. The fact that United States capital has been allowed to flow into Canada's basic industries has enabled their more rapid development and has aided exports by providing sales outlets to associated companies in the United States. On the other hand, United States controlled companies in secondary industries may be limited to sales in markets not reserved for the parent organizations. The significance of this is limited, however, in many cases where the Canadian operation is of a higher cost character than that in the United States. Of basic importance have been the over-all fiscal and monetary policies followed by Canada which, by keeping inflationary developments in check, have enabled exports to be sold at prices which were attractive to external users of the commodities.

(f) Canada's Resources

The various influences which have been reviewed would all be of little significance if the world, and the United States in particular, did not have strong needs for the commodities which Canada can produce on competitive terms. Agricultural, forest, mineral and hydro-electric resources provide the basis for the bulk of Canada's exports. Trade in many agricultural commodities has met with difficulties in recent years. But the world has needed, and has been willing to pay for, the products of Canadian forests, mines and hydro-electric facilities. In exports to the United States, Canada benefits from its location next to the world's largest import market, a market which can buy without thought to foreign exchange considerations. The postwar period has seen the emergence of a greatly increased United States dependence on imports of certain basic materials, to a very significant extent those which can be supplied by Canada. Thus Canada provides the bulk

of United States consumption of newsprint, asbestos and nickel and substantial proportions of other materials, with large future growth expected for such commodities as petroleum, uranium oxide and iron ore. Defence considerations mean that, to the extent to which the United States requires imports, Canada is in a favourable strategic position for development as a source of those requirements.

II. The Postwar Shift in the Direction of Exports

The factors noted in the preceding section are relevant both to the determination of the total of Canada's exports and also to their distribution by areas. No separate analysis of the causes of the area distribution is offered. The present section is concerned with two closely related shifts in the pattern of Canada's exports: the postwar increase in the percentage going to the United States, and the decline in the share to the United Kingdom in comparison with the period immediately before the war.

The broad nature of the postwar changes in the destination of Canada's domestic merchandise exports can be seen from the following table.

Destination of Canada's Domestic Exports
(percentages of total domestic exports, excluding gold,
to all countries except Newfoundland)

	U.S.	U.K.	Continental Western Europe	Other countries ^(a)
1937	36	38	9	17
1946	38	27	12	23
1947	38	28	11	23
1948	50	23	10	17
1949	50	24	8	18
1950	65	15	6	14
1951	59	16	9	16
1952	54	17	10	19
1953	59	16	9	16
1954	60	17	9	14
1955	60	18	8	14

^(a) rounded, so that the total equals 100 for each year.

Data presented in Appendix D.

The postwar increase in the share of exports going to the United States was accompanied by declines in the relative importance of the United Kingdom, continental Western Europe and all other countries as a group. If recent years are compared with 1937, however, most of the relative decline occurred in sales to the United Kingdom, with exports to the Continent showing little change and those to all other countries declining only moderately.

In the early postwar period, overseas countries were faced with serious shortages of goods. For many countries, the effects of the war meant that supplies from domestic sources were not readily available and import needs were all the greater. It was in this situation that large Canadian loans and credits were granted, facilitating purchases in Canada by the United Kingdom and other overseas countries. Exports to the United States were limited both by high levels of demand in Canada in the face of relatively inelastic supply conditions and by overseas commitments. In some cases, export controls on shipments to the United States were used in order that these overseas commitments could be met. Thus, despite the more rapid rate of growth which had occurred in the United States economy, and despite overseas exchange difficulties and restrictions, the share of Canada's exports going to the United States was not much different from the immediate prewar period. The share going to the United Kingdom was below the 1937 level, but there had been roughly offsetting increases in the shares of other overseas countries.

The financing of overseas exports by Canadian credits, a rapid increase in imports from the United States associated with high levels of activity in Canada, and adverse private capital movements produced the Canadian exchange crisis of 1947. While other factors were also at work, the quick recovery of foreign exchange reserves from the low levels reached at the end of 1947 was in considerable measure due to the expansion of exports to the United States. Overseas loans were drawn upon more slowly and then were exhausted or expired. The convertibility experiment ended in August 1947, and sterling area countries reimposed restrictions on dollar imports. Other overseas countries, also, were faced with falling reserves and intensified their dollar restrictions. Exports to the United States, on the other hand, were facilitated by tariff reductions negotiated under the General Agreement on Tariffs and Trade (GATT), first at Geneva in 1947. Governmental efforts were made to expand and divert exports to the United States; important here was the removal of export controls in 1948, a move which was followed by heavy exports of coarse grains, beef and beef cattle. Increased United States demands were also very important, for example, in non-ferrous base metals. Another factor was the exchange rate adjustment of 1949, the immediate effect of which was to cheapen Canadian goods in the United States and to make them more expensive in the United Kingdom and other overseas countries. An important offset was provided by the European Recovery Program under which substantial United States funds were available for spending on Canadian exports. Nevertheless, Canada's overseas exports declined sharply in value from 1947 to 1950, while exports to the United States approximately doubled.

Some of the forces at work in the period immediately after Canada's exchange crisis, and the new ones introduced by the Korean emergency, were temporary. But, while exports to the United States of cattle and beef,

for example, have not retained the magnitudes achieved, this development has been offset by increases elsewhere. Total exports to the United States have continued to increase since 1950, although more slowly than over the three or four previous years, and the United States share of total Canadian exports has remained high. Significant enduring factors have been the rapid rate of growth of the United States economy and its developing needs for the materials supplied by Canada. Terms of access to that market have been relatively easy for basic materials, while restrictions on many of Canada's traditional exports have continued in overseas countries. Becoming gradually more important in enabling rising exports to the United States has been the great expansion in the discovery and development of Canada's mineral resources, an expansion in part undertaken by United States capital and enterprise.¹⁰

More information on the postwar growth of Canada's domestic merchandise exports to the United States is set forth in the table in Appendix E. That table presents data, for 1937, 1947, 1948, 1950 and 1955, covering Canada's exports of a number of major items to the United States and to the world as a whole. In order to present the most meaningful quantity data, the finest commodity breakdown appearing in *Trade of Canada* is used. While 34 items are presented (including a few less important ones to increase comparability over time), they cover only 67% of 1955 domestic merchandise exports to the United States and 68% of the \$1,525 million increase in these exports between 1947 and 1955. Thus they encompass a substantial amount of the trade and the postwar increase, but by no means tell the whole story.

The data in Appendix E are difficult to summarize and their varied behaviour can best be seen by examining the individual items in the table. In general, they show substantial value increases in exports to the United States between 1947 and 1955, although there were declines in the cases of unpeeled pulpwood other than poplar, unbleached sulphite wood pulp (both strong and news grade), lead in pigs or refined lead and crude asbestos (a minor item included to increase comparability over time). Over the same period, however, exports to the United States of all pulpwood, wood pulp, lead and products, and asbestos and products each increased in value. Among the items in the table, 1955 values were below the 1937 level only in the cases of wheat and beef cattle over 700 pounds. Exports of all cattle to the United States were also down between the two years.

Of the 33 items for which data for each of the years 1947, 1948, 1950 and 1955 are presented, the volume of Canada's exports to the United States rose between each of the years in 14 cases. In four others, the volume rose with interruptions but was much higher in 1955 than in 1947. For nine items, the volume of exports to the United States rose after 1947 and then declined,

¹⁰ A more detailed analysis of export and other balance of payments developments in the first seven postwar years is contained in the D.B.S., *The Canadian Balance of International Payments in the Postwar Years, 1946-1952*.

but remained above the 1947 level. Declines following initial rises carried volumes below the 1947 level for five other items. Only the minor item, crude asbestos, showed a steady volume decline between each of the years.

Considering changes in the percentages of these exports going to the United States, there was considerable variation in behaviour, as well as considerable variation in the importance of the United States market in 1955. For some items — whisky, beef cattle weighing over 700 pounds, beef and veal, unbleached strong sulphite wood pulp, reaper-threshers, and copper in ingots and similar forms — the United States share of the total moved up from 1947 to 1955 but with interruptions in some cases. The percentages of exports of barley, wheat, planks and boards (each of four items), primary and semi-fabricated aluminum, fine nickel and zinc spelter going to the United States rose and then fell, but remained above the 1947 level. Percentages also rose in the cases of paper grades of bleached sulphite pulp and lead in pigs or refined lead, but then fell below 1947. In the case of zinc ore, the United States share fell from 100% in 1947 and 1948, but then rose to nearly 90% in 1955. The share fell, with interruptions in some cases, in peeled pulpwood other than poplar, the remaining four wood pulp items, iron ore and the three asbestos items. Finally, for red cedar shingles, unpeeled pulpwood other than poplar, newsprint, crude petroleum and crude artificial abrasives the high United States shares remained relatively stable.

Information of the same nature on Canada's domestic merchandise exports to the United Kingdom is presented in the table in Appendix F. These data cover 1937, 1947, 1950 and 1955 and show Canada's exports of a number of items of major importance to the United Kingdom and to the world as a whole. Again the finest commodity breakdown is used. The table covers 67% of Canada's domestic exports to the United Kingdom in 1937, about the same as the share of 1937 exports to the United States covered in the table in Appendix E. Yet, unlike the data presented for the United States where the coverage remained relatively constant for each year shown (between 63% and 67%), the share of exports to the United Kingdom included in the items in the table in Appendix F rose from 67% in 1937 to 73% in 1947, and to 83% in 1950 when exports to the United Kingdom fell to their lowest postwar value. For 1955, the coverage — at 75% of the total United Kingdom trade — was still above 1937. As a group, therefore, the items covered in the table have become more important in Canada's export trade with the United Kingdom, so that an analysis of them cannot present a wholly typical story of what has taken place since the prewar period. Part of the difference is accounted for by a decline in the importance of manufactured or processed goods, as well as some agricultural items, none of which is important enough to be shown in the table but which, in the aggregate, help to explain the change.

Most of the items in the table in Appendix F show increases in the value of exports to the United Kingdom between 1937 and 1955. Value (and

volume) declines did occur, however, for bacon and hams, cheese, eggs in the shell and fine nickel. In each case except that of nickel, exports were higher in value in 1947 than in 1937 but declined subsequently, with bacon virtually and eggs entirely disappearing by 1955. Douglas fir and spruce lumber (planks and boards) also rose in volume between 1937 and 1947 and then dropped below the 1937 volume by 1955. On the other hand, exports of wheat and wheat flour fell after 1947 but were in 1955 still above the 1937 level. For eight items, Canada's exports to the United Kingdom declined in volume between 1937 and 1947 but rose between 1947 and 1955; the 1955 volume was below the 1937 level for copper ingots, etc., lead in pigs or refined lead, and nickel in matte or speiss, but was above 1937 for barley, oil cake and meal, newsprint, platinum and the platinum metals (value data), and zinc spelter. Finally, the volume rose between 1937 and 1947 and continued up in the period 1947 to 1955 in the cases of bright, flue-cured unmanufactured tobacco, hemlock lumber and aluminum.

Turning to the percentage of total exports going to the United Kingdom, no cases of steady increases from 1937 to 1947 to 1955 are found. At the same time, however, the table includes three items for which the United Kingdom share was very high in 1955: oil cake and meal at 97%, unmanufactured tobacco at 83%, and cheese at 92% (all figures based on volumes). A number of other cases where the United Kingdom market took almost half or more than half of the total are also found. The most common case, however, was that where the United Kingdom share of the total declined both from 1937 to 1947 and from 1947 to 1955. This was true of wheat flour, unmanufactured tobacco, Douglas fir and spruce lumber, copper ingots, etc., nickel in matte or speiss, fine nickel, and platinum and the platinum metals. The percentage rose to 1947 and then fell to below the 1937 relation for barley, wheat, bacon and hams, and eggs in the shell. The United Kingdom share of Canada's cheese exports rose and then returned to about the 1937 level, while the post-1947 relative decline in hemlock lumber left the share above the 1937 level. United Kingdom purchases of oil cake and meal and newsprint fell as a percentage of total exports between 1937 and 1947 and then rose to establish a larger share in 1955 than in 1937. Lead in pigs or refined lead and zinc spelter also saw a decline and then an increase in the United Kingdom share, but here the 1955 percentage was below that in 1937. Finally, the share of Canada's aluminum exports taken by the United Kingdom showed relatively little change, remaining at about one-half in each of the three years.

As in the case of the trade with the United States, the movement in major commodities exported to the United Kingdom does not show too much in the way of a typical pattern and can best be studied by examining the detailed trade data, some of which are presented in Appendix F.

THE FUTURE OF THE WORLD TRADING ENVIRONMENT

IN CONSIDERING the prospects for Canada's exports, it is necessary to formulate some general views about the sort of world in which Canadians will live and trade some 25 years hence. This chapter seeks to indicate the environmental framework into which Canadian activity will have to fit. To a large extent, the nature of the subject matter is such that the views expressed must be in qualitative rather than quantitative terms. At their basis lies the assumption that there will be no major war. Further, much of the consideration is predicated upon a continued high level of economic activity throughout the world. This proposition is subject to analytical consideration and it is possible to examine some of the consequences of less than full employment or of a level which is maintained artificially. In essence, however, full employment is in the nature of a basic assumption. From this base, certain judgments are offered as to the character of likely developments. While the march of events may confirm or deny these judgments, it is hoped that they are sufficiently firmly based upon present facts and trends that they provide, in the main, a reliable guide to the probable development of the world trading environment.

I. Political Assumptions

Basic to all the work of the Commission is the assumption that there will be no major war over the next 25 years. The destruction and dislocation attendant upon such a conflict would probably be so enormous as to render meaningless any attempt to look into the future. On the other hand, war might call forth vast technological advances which would greatly affect subsequent economic development, if man were in a condition to employ them after the conflict.

At the same time as it is assumed that there will be no major war, it seems reasonable to anticipate that world tensions will continue, and that economic intercourse with the Soviet bloc will be restricted and subject to non-economic

considerations.¹ The relaxation of this second assumption would involve some adjustments consequent upon the reduction of defence expenditures. In addition, freer trade with the countries of the Soviet bloc might increase competition in a number of raw materials, but at the same time might create added markets for the export industries of the West. The total effect is uncertain, although some judgments are offered below.

Despite the disagreements which exist and may continue to exist, it is also necessary to assume that the composition of the area outside the Soviet bloc will remain as it is today, and that economic forces will be the determinants of what shifts in international trade take place. While there may be some economic integration, it is assumed that Canadian exports will not be excluded from important markets for political reasons (except in so far as such forces as protectionism are regarded as political). Further, it is anticipated that co-operation for the improvement of international economic relations will continue, largely within the institutional framework which has been established since the war.

II. Economic Policy

(a) "Full Employment"

In the future, as in the past, the level of Canada's exports, and of world trade in general, will be profoundly influenced by the levels of incomes and employment, *i.e.*, by the buying power, in important importing countries. To the extent that something approximating full employment is maintained, the exports of all countries will tend to reach their maxima.

During the postwar period, incomes and employment have generally remained high throughout the international trading community. This has been the result of the high levels of spending consequent upon the necessity of repairing direct war damage, the provision of private and public facilities delayed by the more urgent demands of the war, the level of defence expenditures resulting from the tense international political situation, the higher levels of government social services, and the continuing growth of private and public capital investment. As some of these forces have weakened, others have come to the fore. Economic activity has fluctuated but, by and large, such fluctuations have been within relatively narrow limits. In general, the problem has not been that demand was insufficient to assure adequate levels of employment, but rather that demand tended to exceed the ability to produce, so that prices have been pushed upward.

For the future, a basic tenet of economic policy throughout the world is that a high and stable level of employment should be maintained. This does not mean that everybody must be employed at all times; the costs resulting from the inflexibility associated with over-full employment are well known.

¹ For brevity of expression, the phrase "Soviet bloc" is used to include the U.S.S.R., Albania, Bulgaria, Czechoslovakia, Eastern Germany, Hungary, Poland, Rumania, mainland China, Mongolia, North Korea and Vietnam.

But it does mean that a significant proportion of the labour force must not for long be without opportunity for employment. The degree of unemployment which can be tolerated will vary from country to country and perhaps over time, but governments will be under enormous pressure to prevent the re-emergence of such conditions as existed in the early 1930's. The war demonstrated the power of governmental action to eliminate substantial and persistent unemployment, and governments will not soon be allowed to forget this lesson.

In these circumstances, need a consideration of the trading environment be concerned about income and employment? A decline in investment, or in other important areas of demand, might weaken the basis for present prosperity. In such circumstances, it is to be expected that governments would, if necessary, act to maintain reasonably high levels of activity. The necessity for such "artificial" maintenance of activity, however, could have consequences for world trade. It is not suggested that normal governmental measures undertaken to maintain stability or to meet a minor decline in activity need have significant effects on trade. Nevertheless, if a government were forced to spend substantial sums to maintain employment, it would probably find it difficult to see the funds which it pumped into the economy spent on imports, to the benefit of foreign rather than domestic employment. Just as the United States restricts the import of commodities the prices of which are supported under its agricultural programme, so imports might tend to be restricted where public funds were being spent to stimulate employment. The effects of higher imports in stimulating foreign demand and, thus, higher exports and domestic employment might well seem incomplete and uncertain. Probably much more apparent to governmental authorities would be the more immediate employment effects of curtailing imports which could be replaced by domestic production.

Other countries, even if not initially affected by the decline in activity, might soon be forced in to the position of restricting their imports. The drop in their exports consequent upon increased restrictions abroad might cause unemployment or at least sufficient uneasiness to produce retaliation. For some, the decline in exports, and perhaps in the inflow of international investment which supported an import surplus, might produce balance of payments problems. Difficulties might be avoided, or their impact delayed, through the use of exchange reserves, drawing on the International Monetary Fund, or depreciation of the exchange rate. But available resources and the extent to which an exchange rate depreciation would be acceptable would both be limited, so that here too restrictions on imports might be increased.

The foregoing suggests that the necessity for widespread governmental activity to maintain employment could mean a cumulative increase in restrictions affecting imports and, thus, a cumulative decline in the level of world trade. The case has been put in strong terms. It assumes a ten-

dency to a decline too great to be met by normal monetary and taxation measures alone, but which induces the spending of substantial government funds and, perhaps, support to import-competing industries. Even so, the effects upon trade could be prevented through international co-operation which took into account both the direct and indirect economic effects of alternative courses of action and by the exercise of wise international statesmanship. Yet the dangers cannot be ignored.

It is not the purpose of this study to examine in detail the likelihood of the maintenance of worldwide full employment without the necessity of special governmental measures. Nevertheless, it is relevant to stress the extent to which the current high level of activity rests on governmental spending and investment. In the United States, the world's largest importer, about 20% of G.N.P. in 1955 resulted from government purchases of goods and services — 11% national security and 9% other. Gross private domestic investment accounted for over 15% of 1955 G.N.P., so that only 65% rested on personal consumption expenditures. The role of consumption was down sharply from 1929 when it accounted for 76% of G.N.P., this change being offset almost entirely by the growth in government spending.²

Much expert opinion today is very bullish, foreseeing a general continuation of high levels of activity and upward pressures on prices, with but minor and short-lived setbacks appearing from time to time. There are grounds for cautious optimism that relatively high employment can be maintained without special governmental measures undertaken to support it. Nevertheless, if present governmental expenditures should be reduced, a much greater burden could be placed upon spending in other sectors of the economy. The easing of the governmental financial position and the tax reductions consequent upon a reduction of defence expenditure would, of course, tend to produce some more or less automatic increase of expenditure in other fields. Yet an analysis of the future based upon an assumption of continuing "natural" full employment — as almost all such analyses will be — involves essentially a consideration of the maxima which can be obtained. Such a situation may continue to exist, and there is a universal hope that it will, but the possibility that actual results will not come up to the maxima forecasted cannot be ignored.

(b) Restrictions Affecting Imports

If it is assumed that the level of employment will, in general, be maintained without special governmental measures, what is likely to be the world commercial policy environment?

² United States Department of Commerce, *Survey of Current Business*, July 1956, pp. 10-11. The discussion in the text ignores net foreign investment which amounted to 0.7% of G.N.P. in 1929 and -0.1% in 1955.

The postwar period has seen both a reduction of tariff barriers and a significant relaxation of the exchange and trade restrictions which had been inherited from the war. As the effects of dislocation and destruction resulting from the war have been overcome, and production has risen far above prewar levels, balance of payments difficulties have been lessened. Aiding this development was the adoption of more realistic foreign exchange rates and the increased reliance on monetary and fiscal policies as means of overcoming the causes of payments difficulties. The International Monetary Fund has urged upon member countries the desirability of relaxing restrictions where possible — in their own interests as well as in those of the international trading community — and has assisted members in overcoming difficulties standing in the way of relaxation. Similar policies have been pursued through the General Agreement on Tariffs and Trade (GATT) and by the Organisation for European Economic Co-operation (O.E.E.C.). Thus, governments have found it possible and desirable to reduce the barriers to trade and exchange which they had erected.

Although there remains scope for further progress, and increased freedom continues to be the generally announced goal, a number of factors stand in the way of additional relaxation and there has been some slowing down of progress. Uncertainty as to what the future may bring causes reluctance to dismantle remaining direct restrictions, even in countries which admit that balance of payments difficulties no longer exist. Such countries may hesitate to take the final step and cut themselves off from the restrictive mechanism upon which they have depended in the past and which might be useful in possible future difficulties. Other countries feel that their balance of payments and exchange reserve positions are still too weak to allow them to do without restrictions.

Another factor holding up the removal of exchange and trade restrictions, even after they are no longer justified by the balance of payments, is the desire to protect domestic industries. To some extent, these industries have developed behind the system of restrictions and it is easier in the present international environment to provide protection through the continuation of an import and/or exchange quota than to raise the tariff, which will frequently involve international negotiation and perhaps the granting of compensation. Protectionist pressures are such as to make the final stages of relaxation the most difficult. Restrictions can be removed to the generally recognized benefit of the country undertaking the action as long as there is a large area from which to choose. Such relaxation can mean more abundant and cheaper goods to the consumer and cheaper raw materials for industry, benefiting the health of the economy and its export competitiveness, without providing serious competition to domestic producers. As relaxation progresses, however, it becomes more and more difficult to move further without selecting commodities produced domestically, in some cases by industries developed behind and because of the restrictions which have been in force.

One important aspect of the protectionist problem is the use of restrictions to protect domestic agriculture. Agricultural protection has part of its basis in security considerations; it is frequently related to the real or alleged political importance of the farm population; and there is often expressed the desire to retain balance in the economy and the benefits of farming as a way of life. Home markets for high cost and frequently subsidized agricultural producers are protected both by cost-raising devices, such as tariffs, and by restrictions, such as prohibitions and quotas, which limit imports without raising *landed* costs. Where production called forth by high net returns to producers cannot all be sold domestically, sales abroad may be stimulated by export subsidies and other devices. Thus, low cost producers of agricultural commodities find their entry into natural markets restricted and face subsidized competition for the limited markets available.

Prospects would seem to be for a continuation of substantial agricultural restrictions. It is further to be expected that these restrictions will continue to include those of a quantitative type as well as tariffs. Tariffs might have to be raised to very high levels in order to achieve the limitation presently provided through quotas, etc., and countries may be unwilling to advertise the degree of protection necessary to achieve their purposes. Further, where domestic production is subsidized but some imports remain necessary, governments may be unwilling to raise the costs to consumers to the extent which would result if imports were limited only by high tariffs. With production stimulated by artificially supported prices, the existence of surpluses will probably continue to result in pressures for export subsidies and other sales incentives.

The strength of the desire to continue agricultural protection was demonstrated at the Ninth Session of the CONTRACTING PARTIES to the GATT in 1954-55, which undertook a review of the General Agreement. At that session, the CONTRACTING PARTIES were concerned mainly with the problem of agricultural protectionism when they passed a decision under which the obligations to remove quantitative import restrictions no longer needed for balance of payments purposes could be waived subject to compliance with certain conditions. While a waiver under this decision might not be given for a period exceeding five years, this provision has been regarded as too restrictive by at least some countries seeking to continue agricultural protection. By another decision, the CONTRACTING PARTIES granted to the United States a waiver of GATT provisions to the extent necessary to prevent a conflict with such provisions in the case of action required to be taken by the United States Government under Section 22 of the United States Agricultural Adjustment Act.³ No time limit was placed upon the waiver and it did not limit action to commodities presently under restriction.

³ Section 22 of the Act provides that, whenever the President of the United States finds that products are being or are practically certain to be imported into the United States in such quantities and under such conditions as to render ineffective or materially interfere with an agricultural programme, he must take action to prevent imports from having such effects. Measures imposed include both the establishment of import quotas and the imposition of fees charged upon imports.

Arrangements for the disposal of surpluses also came up for consideration at the GATT session and a resolution on this matter was passed. This, however, was essentially only an expression of "intention to liquidate any agricultural surpluses . . . in such a way as to avoid unduly provoking disturbances on the world market that would adversely influence other contracting parties" and a call for consultations with other interested contracting parties by a country when arranging to dispose of agricultural surpluses. In the proposed revision of the General Agreement, additional provisions on export subsidies were agreed by the delegations to the session. In these provisions, "primary products" are treated separately from other commodities and subjected to the basic limitation only that the subsidy shall not be applied in a manner which results in the receipt of more than an equitable share of world export trade in the product.

While the agricultural field provides a striking case, protectionist pressures continue to exist elsewhere. Strong forces aiming at the continued protection of manufacturing are to be found throughout the world, although their effects may be regarded as less insidious, since, in the absence of balance of payments difficulties, such protection is more likely to be applied through tariffs. Even for manufactured goods, however, the complete elimination of restrictions other than tariffs will meet resistance.

A feature of the postwar period has been the strength of the desire of underdeveloped countries to achieve political and economic independence.⁴ In the economic field, this finds its expression in a burning desire to achieve economic development at the speediest possible pace and in programmes aimed at such achievement. The economic development which is desired is generally in large measure industrial development and, indeed, the programmes are sometimes subject to outside criticism as involving some neglect of the primary industries in which the underdeveloped countries are relatively more efficient. In any event, aspirations are for the diversification of industry which, these countries believe, will raise domestic standards of living and make the economy less subject to external shocks. While light industry such as textile manufacturing is frequently established at early stages, the programmes run far beyond this and often envisage the creation of relatively complex heavy industry.

In general, although by no means universally, economic development is being undertaken behind a relatively high wall of restrictions. Industries which are being developed are protected by high tariffs, special treatment in the exchange market and quantitative limitations affecting imports. Even after they have been established for some time, it is likely that many of them will be of a relatively high-cost nature so that the pressure for protection will continue. Further, while a number of underdeveloped countries have

⁴ As is suggested in paragraph 4 (a) of proposed revised Article XVIII of the General Agreement on Tariffs and Trade drawn up at the Ninth Session of the CONTRACTING PARTIES, an underdeveloped country may be defined as one "the economy of which can only support low standards of living and is in the early stages of development".

indicated their recognition of the need to avoid inflation, some have also shown their inability to avoid it. In part, this is related to the nature of their economic and administrative systems. In part, it results from their efforts to divert resources to development (sometimes on top of substantial armament expenditures) without there being a corresponding reduction of consumption or inflow of capital. In the future, economic development may be expected to continue to be associated with inflation in a number of countries. This, in turn, will mean a continuation of balance of payments difficulties, as a result of high demands for imports and the raising of costs in the export industries. Thus, there will be a continued use of restrictions to prevent the draining away of exchange reserves as well as to provide protection. For some countries, continued use of multiple exchange rate systems and depreciating exchange rates may be expected.

Many underdeveloped countries may thus be expected over the next 25 years to maintain significant restrictions affecting imports and perhaps export promotion devices (through multiple currency practices, bilateral agreements, etc.). Facilities enabling them to increase tariff protection, to apply quantitative restrictions for balance of payments purposes, and to take other measures were incorporated into text of, and more into the spirit behind, the proposed revised Article XVIII of the General Agreement on Tariffs and Trade agreed at the Ninth Session of the CONTRACTING PARTIES. The restrictions on imports will undoubtedly fall most heavily on commodities which can be produced locally, especially those involved in the development programme, and on goods regarded as luxuries. Treated more liberally will be basic raw materials not available locally and goods needed for economic development.

Although protectionist forces and the possibility of periodic balance of payments difficulties cannot be ignored, the outlook for the continued reduction of restrictions is better in the more industrialized areas of the world, particularly outside the field of agriculture. A very favourable development has been the fact that various major trading countries have come more and more to rely on fiscal and monetary policies to meet balance of payments fluctuations. In this way, they have avoided increasing restrictions directly affecting trade in the face of temporary difficulties. Reliance on indirect controls is far from complete; yet, in the absence of severe deflationary shocks, the trend is likely to continue and there should be a progressive reduction of remaining restrictions.

Despite the prevalence in the early postwar years of views such as that which held that Western Europe faced a structural dollar shortage, very substantial relaxation has been possible without general payments difficulties. The remarkable growth of production outside North America and its efficiency has aided, and in turn been aided by, the removal of restrictions. Continued growth of world production and trade in the future should be accompanied by further relaxation of restrictions, although in many areas

progress may not be automatic but may require continued urging by other countries adversely affected and by international organizations. Tariff barriers will undoubtedly remain, although there is hope that they will be lessened over the quarter century under consideration. Progress in the tariff field has slowed down since the first two rounds of GATT negotiations in 1947 and 1949. With protectionist demands and the increased significance of tariffs as a result of the reduction of protection through restrictions of other types, future progress will probably be slow. Continued efforts in the field should, however, bring some reductions. Protectionism, the desire for economic development and the continuation of balance of payments difficulties in some countries will undoubtedly delay the removal of exchange and trade controls limiting the movement of goods, so that, in certain areas, they may well be in force over the next 25 years. In addition, the emergence of a more permanent regionalism or regional economic integration of the sort to be discussed in Subsection (e) may mean that further relaxation against non-members of the region will be delayed. On balance, however, stability and growth should mean continued progress in the relaxation of exchange and trade restrictions and should enable their elimination over an increasing range of international trade and payments. To the extent that major trading nations move forward in the reduction of trade barriers, the resistance of others will decrease. In this connection, the United States, as the world's largest producer and trader, occupies a key position. The outlook for policy developments in major trading areas is considered below.

(c) *Convertibility*⁵

The convertibility of major currencies has now been anticipated for so long that any prediction of when it will be achieved would be rash. Some countries contemplating the move have felt that balance of payments problems must still be overcome, or that larger exchange reserves must be built up or assured. Others are reluctant to move by themselves, particularly before sterling becomes convertible. It is possible that the adjustments attendant upon the creation of a regional free trade area, or some other regional arrangement of a more or less permanent nature, may further delay final action.

As it has been outlined, the establishment of formal convertibility would not mean an immediate return to complete freedom in exchange transactions. In general, it has been suggested that control would continue to be exercised over international capital movements — some countries being more concerned with the control of the outflow and others with the control of the inflow of capital. Further, the nature of the moves taken, at least initially, might vary among countries. Some have stressed what may be called “external” convertibility which would concentrate on the establishment of facilities for the conversion of current earnings of their currencies by all

⁵ The views put forward in this subsection are further developed in the consideration of prospects for the United Kingdom and continental Western Europe in Section III.

other countries into gold or other currencies including dollars. This might, however, be accompanied by some continuation of restrictions on imports, perhaps discriminatory restrictions. Other countries have favoured a system of "internal" or "domestic" convertibility under which they would first free imports from restrictions, allowing the conversion of their currencies into gold or other currencies only if they were earned by countries which were themselves convertible, and settling with inconvertible countries on a restricted, perhaps bilateral, basis.

A number of countries have already taken major steps toward the establishment of convertibility of this nature, with substantial reductions in import barriers and discrimination, the re-establishment of commodity markets, the extension of the transferability of their currencies among non-dollar countries, and the recognition of international currency markets.⁶ Further steps may be delayed by reluctance to take a position from which it would be difficult to retreat. Nevertheless, much of the groundwork has been laid and further progress remains to the objective.

At this stage, it may be worth considering briefly the likely effects of the further removal of restrictions and the establishment of convertibility on world trade, and particularly on Canada's exports. As has been noted, this movement cannot be expected to have widespread effects on trade in agricultural commodities nor to involve substantial commercial policy changes by the underdeveloped countries. Further, trade in manufactures will probably continue to face relatively high tariff barriers as well as other restrictions in some cases. The basic fact, however, is that, with restrictions or without them, a country can import no more than it can pay for. By and large, the countries whose currencies are likely to become convertible have been importing at near their capacity to pay on a continuing basis. Exchange reserves have in some cases increased but, at the same time, external aid and other extraordinary receipts have been obtained. Except in so far as increases occur in these receipts or in borrowing, imports can only be increased substantially if other foreign payments are reduced or if foreign earnings are increased. The possibilities for increased expenditures upon imports must depend largely on exports being increased. Substantial economic growth is expected throughout the world and with it a growth in world trade, although not necessarily at the same rate. In addition, more effective control of inflation and increased efficiency should release resources which could be used to expand exports. Nevertheless, the extent to which convertibility could suddenly enable over-all increases in exports and thus in imports would appear to be limited. In so far as reliance on exchange and trade restrictions

⁶ After reviewing developments, the International Monetary Fund on p. 7 of its *Annual Report of the Executive Directors for the Fiscal Year ended April 30, 1955*, stated as follows: "As a result of all these factors, there is a high degree of effective convertibility of sterling and of the deutsche mark into dollars at discounts which at the time of writing this Report were approximately 1 per cent below the official rates, to some extent this was also true of other currencies." With respect to "the time of writing", the Report's letter of transmittal was dated July 1, 1955. Further developments are discussed in the Fund's 1956 *Annual Report*, pp. 89 and ff; and in its *Seventh Annual Report on Exchange Restrictions, 1956*, pp. 2-9.

is abandoned, countries must use other devices to prevent the demand for imports from exceeding their ability to pay for them; fiscal and monetary controls, perhaps coupled with exchange rate depreciation, must be used where necessary.

To the extent that the possibilities of expanding exports are limited, the removal of remaining restrictions cannot be accompanied by a considerable increase in the imports of the countries taking such action. If this were to persist, the restrictions would have to be reimposed. This is not, however, to suggest that the further removal of restrictions would not be highly desirable. Countries with restrictions can benefit from their further elimination, which will provide more varied and cheaper goods for their consumers and increase the competitiveness of their industries, both by cheapening their raw materials and equipment and by forcing them to meet additional competition. In this way, some increase in exports should be possible. More normal trading relations can be established and fuller advantage can be taken of the benefits of the international division of labour. The necessity of curbing inflationary tendencies will become more apparent and long-run efficiency will be increased.

This healthier world economy will mean gains for all countries, Canada among them. Canada also stands to gain from the reduction of remaining discrimination. But much of the trade in Canada's major exports has already been put on a non-discriminatory basis, and the demand for primary materials has been such that Canadian sales have been substantial even when faced by discriminatory restrictions. Only limited further changes can be expected to accompany convertibility, for the system could not survive a wholesale shift to dollar sources of supply any more than it could a large sustained increase in total imports. Such a shift, however, is not to be expected in view of the improved competitive position of the non-dollar area.

(d) *Bilateralism*

In a world of limited convertibility, vestiges of postwar bilateralism may be expected to continue, although its *raison d'être* is diminished.

Many countries have employed bilateral trade and payments agreements in the postwar period as means of obtaining desired imports, while limiting hard currency settlements, and as means of securing special treatment for their exports. Some bilateral agreements have involved the substantial extension of credit, often beyond that originally contemplated. Other agreements or special bilateral arrangements have been undertaken to secure the liquidation of outstanding commercial debts. Another reason advanced has been the necessity of agreements if trade is to take place with the state trading economies of the Soviet bloc.

While the number of bilateral agreements has continued high, important trading countries have placed less reliance on them in recent years and their

significance in international trade has been reduced. The reduced scope of government purchasing and the relaxation of restrictions and discrimination in Western Europe have reduced the possibilities for carrying out bilateral commitments. Further, the widening of commodity market facilities and the development of transit trade in the same area have reduced the interest of importing countries in access to supplies through bilateral agreements and have made it more difficult for soft currency exporters to exploit their positions. Generally, countries have become less concerned with the maintenance of strict bilateralism in their trading relationships. Moreover, the increased freedom of the transferability among non-dollar countries of sterling, deutsche marks and other currencies, as well as the possibilities of converting soft currencies into dollars at close to parity in the New York market and elsewhere, have reduced the importance of a bilateral balancing of payments. More flexible payments arrangements have been incorporated in agreements, and import lists have increasingly become mere expressions of the intent to facilitate trade in certain directions rather than firm undertakings.

Considerable interest has attached to the replacing of the bilateral arrangements that formerly regulated trade between Brazil and European countries by the machinery of the "Hague Club". Under the new arrangements, Brazilian earnings from transactions with Austria, Belgium-Luxembourg, France, the Federal Republic of Germany, Italy, the Netherlands and the United Kingdom are pooled and the currencies of these countries made interchangeable in Brazilian hands. Brazilian importers obtain certificates enabling them to import from any of the countries and, in addition, Brazil can transfer its earnings of these currencies to other non-dollar countries. Similarly, new arrangements have enabled several countries to extend the transferability of their currencies to certain transactions with Argentina, reducing the strict bilateralism that had formerly governed trade and payments relations with that country.

Despite the favourable developments, pressure to maintain bilateral trade and payments agreements is unlikely to disappear completely. Countries which continue in balance of payments difficulties, including underdeveloped countries, may well seek to continue these devices to push their (high-cost) exports and to avoid or minimize settlements in scarce currencies. At the same time, countries which are not in balance of payments difficulties may seek to use bilateral agreements, and the possibility of granting credit through them, in order to push exports of industries which are not competitive but which they wish to maintain. As has been noted, certain plans for convertibility have envisaged the possibility of bilateral settlements with inconvertible currency countries. This might be through payments agreements or the channeling of exchange transactions into discount currency markets. The extent to which such practices would be acceptable to the international community remains to be seen.

(e) Regionalism

The reduction of discriminatory restrictions and the steps taken to prepare for convertibility have meant that regionalism, as well as bilateralism, has become less significant. Thus, there has been a hardening of the payments arrangements of the European Payments Union (E.P.U.),⁷ and a tendency to increasing settlements in cash, rather than through the E.P.U. mechanism. Further, where countries in balance of payments difficulties have intensified restrictions, this has frequently tended to be on a non-discriminatory basis. Further, relaxations have often tended to be generalized and not only in favour of members of a group. Basic to the change have been the improved production and competitiveness of the members of regional groups, and the desire to bolster that position through access to imports from the cheapest source.

At the same time, however, members of the O.E.E.C. still grant to each other import facilities more favourable than those available to dollar countries, payments are settled through the E.P.U., relatively few barriers stand in the way of trade and payments within the sterling area, and the countries of Asia and of Latin America periodically discuss the desirability of closer regional ties of the O.E.E.C.-E.P.U. type.

The coming of convertibility, carrying with it the possibility of settling current balances in gold or dollars, would bring a further weakening of the basis for regionalism. It would, however, be unlikely to involve its complete destruction. Common interests in the strength of sterling would probably mean the continuation of sterling area arrangements within the limits set by convertibility, with members other than the United Kingdom and the Union of South Africa continuing to hold most of their reserves in sterling. It is also possible that tighter regional arrangements will be entered into in Asia and in Latin America, although in neither area are the circumstances likely to be as favourable to such a development as they were in Europe in 1948-50.

In Europe, the situation is more complex. Convertibility of the currencies of major member countries is to mean the termination of the E.P.U. but, when that happens, a European Monetary Agreement is to come into force. This agreement, approved by the Council of the O.E.E.C. on July 29, 1955, provides for the establishment of a European Fund and a Multilateral System for Settlements. The former would make short-term (up to two-year) credit available to members on an *ad hoc* basis to help them overcome payments difficulties threatening the maintenance of their level of trade liberalization in Europe, while the latter would not extend credits beyond 30 days.

⁷ Under the prolongation of the E.P.U. approved by the Council of the O.E.E.C. on July 29, 1955, the gold-credit ratio for the settlement of surpluses and deficits incurred by member countries was changed from 50% credit and 50% gold to 25% credit and 75% gold. At the same time, arrangements were introduced under which the E.P.U. could be replaced by a European Monetary Agreement which would be more appropriate to conditions under which major European currencies were convertible.

In July 1956, the O.E.E.C. Council renewed the E.P.U. for another year, with the same gold-credit settlement ratio and the same termination provisions.

Newer developments suggest the likelihood of tighter regional arrangements in Europe. For some time, there have been discussions of the so-called Messina proposals, envisaging a plan for the formation of a customs union among Belgium, France, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands — which are also the six member states of the European Coal and Steel Community. More recently, considerable attention has attached to the proposal that other European countries might join with the customs union in the formation of a free trade area.⁸ Thus, the United Kingdom has indicated its intention of associating itself in this way with the "common market". Others who might join the group include the Scandinavian countries and other members of the O.E.E.C.

Such new European arrangements could not be created overnight. Ten to 15 years might be required for the gradual elimination of tariffs among members and, within the customs union, for the introduction of a common external tariff system. The removal of intra-member tariffs would involve dislocation and adjustment. One of the problems to be faced concerns whether or not a firm timetable would have to be adhered to, come what might. Another problem concerns trade in agricultural commodities. It is reported that the United Kingdom has taken a firm position that these goods must be excluded, so that here Commonwealth preferences would remain. Clearly this would make the plan less attractive to some Continental countries, although others might be prepared to continue some agricultural protection. Institutionally, the proposal for the plan to establish the customs union or free trade area would require the approval of the CONTRACTING PARTIES to the GATT, and might require a waiver by the CONTRACTING PARTIES, *e.g.*, if agricultural commodities were to be excluded.

The proponents of these proposals hope that they will give strength to Western Europe. Through increased competition and specialization, efficiency and the level of production will be increased. Weak members are to become strong and the dominance of strong members is to be reduced. Political as well as economic consequences are expected to result, with the trading area becoming a force comparable to the United States and the Soviet bloc. One reason alleged to be behind the move is the failure of the United States to follow a "good creditor" policy. For individual countries there is the fear that, if they do not join, the plan will proceed without them and they will be shut out.

For the participants, much would turn on the struggle between freedom and protectionism. The benefits of increased efficiency could only be achieved after painful adjustments, in which producers in some countries would have to reduce their costs to the lower levels obtaining elsewhere or

⁸ In their pure forms, both a customs union and a free trade area involve the complete elimination of all tariff affecting trade in domestically produced goods among members. A customs union requires also a common tariff against non-members, while, under a free trade area, each member has its own tariff structure against outsiders. Thus a free trade area requires the control of intra-area trade to assure that each member applies its appropriate duties on goods originating outside the area — raising difficult questions related to the definition of origin.

would be put out of business. Differences in wage rates and in the level and age of capital equipment would make adjustment all the harder. In these circumstances, questions arise as to whether the plan would be pursued relentlessly or if its final fruition, and benefits, could be delayed. Is there danger that, instead of increased competition lowering costs, protection against competition from outside the area would enable the inefficient to survive and create a high-cost bloc of indefinite duration?

The problems of adjustment to freer intra-area trade would undoubtedly be such as to require much of the energies of the participants for many years to come. Thus, while it might be suggested that, if the effort were successful, convertibility would ultimately be easier to maintain, its introduction would likely be put off for a considerable time. Meanwhile, exchange reserves would tend to be conserved to meet intra-area transfers during the adjustment process. Similarly, the further removal of discriminatory restrictions against the dollar area might be delayed. The danger would be that some restrictions might be intensified, although, in view of the desire to maintain efficiency, this would presumably not affect raw materials.

It seems to be generally agreed that U.K. participation in a European free trade area would largely end what hopes Canada might still have for recovering the U.K. market for certain manufactured exports which have virtually disappeared in the postwar period. Generally, all outsiders would face increased competition and the possible exclusion of some commodities from European markets. The effect on exports of basic materials would probably not be great, unless overseas territories and particularly overseas members of the sterling area were brought into the group — and then only if tariffs or other barriers against non-participants were significant. Competition from Scandinavian timber and the products of power-based metallurgical operations could also increase, however, at least in the short run. Outside assessment of the plan — as to both its political and economic effects — must turn on the expectation held regarding its chances of complete success. If it did in fact create a more efficient and prosperous Western European community, it could ultimately mean higher levels of world trade. On the other hand, it contains the seeds of a more permanent division of the trading world into a dollar area and a non-dollar area. The “join or be shut out” approach is somewhat ominous. If the plan were to bog down part way through, the rest of the world would be left facing a protected area without the offsetting benefits resulting from the creation of a larger market.

At the time of writing, it appears that steps will shortly be taken to set up the customs union and later the free trade area. Even if this particular plan were never put into effect, however, its consideration would be relevant as it seems to be symptomatic of one direction in which commercial and financial policy is developing today. Regionalism seems likely to be more important than might have been suggested a year or two ago, and with

it there is at least the short run possibility of more restrictions on inter-regional trade than might have been anticipated.

Throughout this study, it is assumed that Canada will remain outside any such regional group — that it will remain part of the dollar area. The development of a strong regional bloc in Europe might cause a reassessment of the Canadian position. Yet, in a prosperous world, it is difficult to envisage trade relations with the United Kingdom and the Continent being anything like as important as those with the United States. The initial effect of joining a European bloc would seem to be a tendency for Canada's exports to Europe to grow more rapidly than her imports — assuming, as one must, that European restrictions were removed. To continue, this would require Canadian loans — long-term or through the accumulation of soft currencies. To work off these credits, the next step might well be discrimination against the United States beyond the initial tariff adjustment. The seriousness of this would depend upon European competitiveness, but it could not help increasing some Canadian prices and costs. It might also bring retaliation by the United States, Canada's most important market and the one which is expected to grow more rapidly. More likely, European regionalism, especially if its restrictive features persisted, would tend to force Canada into closer relations with the United States.

III. Economic Prospects by Areas

The economic policy followed over the next 25 years will be different in the different areas of the world. This section considers the way in which commercial policy and thus the demand for imports may be expected to develop in major areas. It also covers forecasts of population and the level of economic activity, as well as the nature of imports into the various areas. For present purposes, the importance of these areas is determined by their significance and potential significance as buyers of Canada's exports. Past behaviour is summarized as follows from the data presented in Chapter 1.

Destination of Canada's Domestic Exports (percentages, excluding gold and exports to Newfoundland)

	1928	1937	1955
United States.....	36	36	60
Other Western Hemisphere.....	3	4	4
United Kingdom	22	38	18
Australia, New Zealand, South Africa....	3	6	3
Rest of sterling area	3	3	3
Continental Western Europe	26	9	8
Japan	3	3	2
U.S.S.R., Eastern Europe, mainland China	2	1	0
All others.....	2	1	2
Total.....	100	100	100

(a) The United States

The United States, which had been Canada's most important export market in the late 1920's, was slightly exceeded by the United Kingdom in the late 1930's. Since the end of the war, however, it has assumed a dominant position. Compared with 36% in 1928 and 1937, the United States share of Canada's domestic merchandise exports (excluding exports to Newfoundland) reached almost 50% in 1948 and 65% in 1950. Subsequently, the percentage has declined; but, in 1954 and 1955, the United States took three-fifths of Canada's exports.⁹

The importance of the United States to Canada's exports is much greater than is indicated by the high percentage of sales to that country. United States total imports are greater than those of any other country and their size, and the conditions affecting their size, are of very great importance to the economic health of the rest of the world and to its ability to pay for imports, including imports from Canada. In recent years, United States total transactions with the rest of the world — merchandise, military expenditures, services, capital movements, and government grants and loans — have resulted in substantial accumulations of gold and dollars by the rest of the world. In the year ended June 30, 1956, transactions with the United States and purchases of newly mined gold increased non-United States gold and liquid dollar holdings by US\$ 2 billion, of which it may be estimated that less than half was accounted for by newly mined gold.¹⁰ In no small measure, the ability of overseas countries as a group to settle their persistent deficit with Canada rests upon the level of United States imports, military expenditures abroad and foreign aid.

Recent growth in the *population* of the United States has continued to surprise forecasters. On October 20, 1955, the United States Bureau of the Census released estimates revising upward the forecasts to 1975 which had been put out little more than two years earlier but which, in their highest series, had underestimated the 1955 population.¹¹ These projections assumed that there would be no disastrous war, major economic depression, epidemic or other catastrophe. Four sets of fertility assumptions were employed, but all estimates were based upon the same assumptions of mortality rates and immigration. On this basis, the 1955 study projected total United States population as growing from 165.2 million on July 1, 1955 to between 206.9 and 228.5 million in 1975, an increase of 25% to 38%. If these "extreme" series are projected graphically for another five years, they suggest a 1980

⁹ In addition, exports to Alaska, American Virgin Islands, Hawaii, Puerto Rico and United States Oceania amounted to 0.1% in 1928, 0.2% in 1937 and 0.4% in 1955.

¹⁰ U.S. Department of Commerce, *Survey of Current Business*, September, 1956, p. 7; and International Monetary Fund, *International Financial Statistics*, December 1956, p. 21.

¹¹ U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P-25, No. 123, "Population Estimates", October 20, 1955. The previous estimates were in *Current Population Reports*, Series P-25, No. 78, "Illustrative Projections of the Population of the United States, by Age and Sex: 1955 to 1975", August 21, 1953.

population of between 215 million and 248 million or an increase of 30% to 50% over 25 years.

Studies forecasting the economic future of the United States as far ahead as the 1970's have foreseen a rapid growth in total production or Gross National Product in constant dollars. Assuming a 27% increase in the labour force (and population growing to 193 million), a 15% decline in the number of hours per worker, and a 2.5% per annum rise in product per man-hour, the Paley Report arrived at the projection of a doubling of G.N.P. between 1950 and "1975", by which was meant "sometime in the 1970's".¹² While G.N.P. was expected to double between 1950 and 1975, gross private domestic investment was seen as rising by only 40%. In part, this was explained by the relatively high level of investment in 1950 (18% of G.N.P. as compared with 15% in 1955). At the same time, however, government expenditure and net foreign investment were projected as totalling 19% of G.N.P. in 1975, as compared with 15% and a negative amount, respectively, in 1950. No increase was expected in the output of some industries, such as shipbuilding, telephone equipment and farm machinery. Residential construction and passenger automobiles were expected to rise by only 15%. Products with fast growing uses, however, such as aircraft, plastics, insecticides and the newer synthetic fibres, were projected as increasing by 400%. Finally, to the detailed projections there was added an "allowance for exports".

As has been indicated, forecasts of United States population have been raised since the writing of the Paley Report. Thus the Paley estimate of the labour force and of G.N.P. calculated from it for 1975 now appear to be low by at least 10%.¹³ Despite such shortcomings which become clear through hindsight, it is of interest that the Paley G.N.P. forecast has been used in subsequent official United States projections. Thus, in material presented in October 1954, the staff of the Joint Congressional Committee on the President's Economic Report, after presenting its own projections up to 1965, used the Paley figure for 1975 (adjusted to the 1953 price level) — although noting the underestimation of population.¹⁴ Similarly, in the G.N.P.

¹² *Resources for Freedom*, a Report to the President by the President's Materials Policy Commission, June 1952, U.S. Government Printing Office, Washington, D.C., 5 volumes, hereafter cited as *Paley Report*.

The basic projections were contained in Chap. 22 of Vol. II prepared by Arnold C. Harberger of Johns Hopkins University but were accepted elsewhere in the Report. (See, for example, Vol. I, pp. 6-7.)

The explicit assumptions appearing in Chap. 1 of Vol. II (p. 5) were that population and productivity would grow at specified rates, that international tension would continue, that a third world war would be prevented, and that high level employment and economic prosperity would prevail in free countries. Account was taken only of those technological developments whose applications were clearly foreseeable at the time of writing. A final assumption was that the raw materials would be freely available at approximately the prices prevailing in 1950, abstracting from inflation or deflation in the general price level.

¹³ The estimation of an understatement "by at least 10%" has been obtained from an unpublished paper, "*Economic Projections for the United States Economy*", prepared for the Commission by George T. McColm. In arriving at this estimate, the effect of a low labour force is in part offset by the fact that the rate of decline in average hours per week did not appear to anticipate as great a rate of decline as had been evident.

¹⁴ Staff of the Joint Committee on the Economic Report, *Potential Economic Growth of the United States During the Next Decade*, United States Congress, Joint Committee Print, U.S. Government Printing Office, Washington, D.C., 1954, pp. 8, 23 and 35.

projection employed in the large 1956 study by the United States Bureau of Mines, the 1975 figure was derived from the Paley Report.¹⁵ The United States Forest Service, in its recent examination of timber resources for the future, made its own projections. Nevertheless on the basis, *inter alia*, of a population of 210 million, 1975 G.N.P. was forecast at almost the exact figure of the Paley Report, adjusted to 1953 dollars. This study also covered the period to the year 2000, and projected a further 90% rise in G.N.P. between 1975 and 2000.¹⁶

A lower estimate of the growth of G.N.P. was used in a report by Stanford Research Institute which has been examined for this study in connection with the future demand for forest products. In this projection, population was expected to grow to 212 million in 1975, while between 1950 and 1975 the civilian labour force would grow by 40% and average weekly hours decline by 11%. At the same time, however, gross private production per man-hour was projected as rising by only about 1.6% per annum, so that G.N.P. (at a constant price level) would rise by only 68% between 1952 and 1975 or 85% between 1950 and 1975.¹⁷

A more optimistic forecast was contained in a series of articles published in 1955 by Peter F. Drucker.¹⁸ Over the next two decades he foresaw that the basic problem was likely to be inflation accompanied by a labour shortage. While population rose by at least 40% between 1955 and 1975, the labour force would rise by 20% and total hours worked by only 10%. The threat of inflation made increased productivity a paramount need and the author implied that total production would double over the 20-year period. This would involve an annual rise of slightly over 3% in productivity. In this analysis, investment needs were seen as rising more rapidly than total production. Professor Drucker commented on automation which, he felt, meant that a sizeable portion of capital spending would be carried out independently of the business cycle.¹⁹ He pointed out that few businesses stopped or even cut back their capital expenditures programmes in the "inventory recession" of 1951 or the recession of 1954. Investment programmes were regarded as integrated and long term and hardly adaptable, once begun, even to major cyclical fluctuations. Automation should bring even greater stability.

¹⁵ U.S. Department of the Interior, Bureau of Mines, *Mineral Facts and Problems*, U.S. Government Printing Office, Washington, D.C., 1956, p. 12.

¹⁶ U.S. Department of Agriculture, Forest Service, *Timber Resource Review* (Preliminary Review Draft Subject to Revision), September 1955, Chap. I, pp. 9-12, and Chap. VI, pp. 10-14.

¹⁷ *America's Demand for Wood 1920-1975, Summary of a Report by Stanford Research Institute*, Stanford, California, to Weyerhaeuser Timber Company, Tacoma, Washington, 1954. Basic assumptions were that there would be no all-out war, but that a high level of military preparedness would continue; that there would be no radical advances in technology to increase productivity at a higher rate than in the past; and that there would be a higher degree of business stability than in the past 25 years, which would be accompanied by high, but not full, employment (pp. 11-14).

¹⁸ "America's Next Twenty Years" by Peter F. Drucker in the March, April, May and June 1955, issues of *Harper's Magazine*. The population and production forecasts were contained in the March issue.

¹⁹ Article in the April 1955 issue of *Harper's Magazine*.

United States *imports* constitute a relatively unimportant magnitude in the total economy. Between 1947 and 1955, merchandise imports, adjusted for balance of payments purposes, varied between 2.6% and 3.4% of G.N.P.²⁰ Further, while the rise in the volume of imports after the initial postwar recovery tended to parallel the expansion in Gross National Product in constant dollars, the relationship between imports and G.N.P. was lower than in the years 1923-37. In part, this may be explained by the accelerated development of domestic substitutes for, and economies affected in the use of, imported materials during the war.²¹ Nevertheless, the United States is the world's most important importing country, taking about 14% of the 1955 total outside the Soviet bloc. Twenty-three per cent of these imports came from Canada (as compared with 13% in 1937), 29% from Latin America, 16% from the sterling area, and 14% from Continental O.E.E.C. countries.²²

For the future there are indications that United States imports, particularly of basic raw materials, will play a more important role in the economy. The tremendous consumption of the United States has imposed a severe drain on its mineral, timber and water resources. Against this background, the Paley Commission examined the materials problem. A doubling of G.N.P. between 1950 and the 1970's was expected in its Report to require an increase of between 50% and 60% in the total materials stream, with the demand for metals and mineral fuels rising more than this average, agricultural demand somewhat less and forest products demand considerably less.²³ With the depletion of domestic resources, the Report expected that the United States might in 1975 have to import 20% of its consumption of materials other than food and gold, as compared to 9% of the smaller total in 1950 and net exports of 15% in 1900; 1975 imports would thus be about three and one-half times the volume in 1950.²⁴ Net dependence on foreign supplies appeared in many commodities in the 1930's and 1940's, although its influence on total imports was masked by the decline in silk and rubber, the two most important imports in the interwar period.

The expectation of future strength in imports of basic materials was supported by a study of United States imports over the periods 1923-39 and 1946-55 in the November 1955 *Survey of Current Business*.²⁵ Despite relative declines in fibres and rubber, imports of industrial raw materials as a group have accounted consistently for about one-half or more of the value of total imports. Within this group, however, materials used in

²⁰ U.S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, June and July, 1956; and Bureau of the Census, *Statistical Abstract of the United States, 1955*, p. 887.

²¹ Marie T. Bradshaw, Daniel Roxon, and Max Lechter, "Imports and Domestic Business", *Survey of Current Business*, November 1955.

²² International Monetary Fund, *International Financial Statistics*, December 1956, the data being adjusted where appropriate so that the imports of all countries appear on a c.i.f. basis.

²³ *Paley Report*, Vol. I, p. 7.

²⁴ *Ibid.*, Vol. I, p. 2.

²⁵ Bradshaw, Roxon and Lechter, *op. cit.*

non-durable goods production (mainly fibres and leather, and excluding newsprint and petroleum) dropped from 25% of total imports in 1923–29, and 20% in 1930–39, to 12% in 1950–54, and 10% in the first half of 1955. Off-setting this in large measure were increasing shares for petroleum and products and materials used in durable goods production. The latter, which include rubber, rose from 22% of total imports in the prewar period to 28% in 1950–54.

The study suggested that the rise in imports associated with durable goods manufacturing, relative to imports associated with soft goods production, was due only in part to the growing relative importance of durable goods output. Although there was some postwar decline in the relationship of these imports to related manufacturing activity, it was far less than the corresponding decline in the case of materials used in non-durable goods production. Indeed, some technological advances enhanced United States dependence on imports of such commodities as nickel, zinc, tungsten, chrome and cobalt. The fact that United States companies had developed low-cost foreign resources to supplement diminishing high-grade domestic supplies of such key raw materials as copper and iron ore might help to explain why this category of raw material imports had been relatively less sensitive to changes in associated manufacturing activity. Additional factors were the stockpiling programme, the building boom and the effect of strong European demand on prices.

These and other developments meant that the volume of total imports had been more stable during the postwar than in the prewar period. Fluctuations were absolutely smaller and it appeared that total imports were somewhat less sensitive to changes in business activity. This might perhaps be due to the fact that the downswings in business activity during the postwar period were minor adjustments in a period of substantial growth. It might also be attributable to changes in the import pattern, particularly to the rising share of the total value held by petroleum, paper and foodstuffs. Imports related to durable goods production were, in the case of many materials, less sensitive to change in total demand than might be expected, due to lower costs of production and the better competitive position of some materials produced abroad. The reduction in import volume from 1953 to 1954 was largely due to special circumstances, such as the drop in coffee imports in the face of price increases.

Finally, the study noted the pronounced increase from the prewar to the postwar period in the relative importance of the Western Hemisphere as a source of United States imports — nearly 55% in the first half of 1955 as compared with about 35% in 1929 and 1937. This development resulted mainly from the greater concentration of import demand on metals, newsprint, petroleum, coffee and other items which traditionally have been obtained from the Western Hemisphere.

More extreme was the position taken in a recent article by Professor Drucker in which he stated that the Paley Commission seriously under-rated both the speed of United States economic expansion and the rate at which the demand for raw materials would grow. Developments of the past five years were said to have shown that raw material needs increase much faster than production and consumption, perhaps twice as fast. It appeared reasonable to guess that, in order to double national income within 15 to 20 years, the United States would have to import the equivalent of at least one-quarter of its total industrial production. The problem for the future would be not the dollar shortage, but how to earn enough foreign exchange to pay for United States imports. Other countries, too, would have great materials demands and the aim of United States policy should be to promote the rapid industrialization of the countries that produce raw materials. This, it was suggested, would both expand the demand for United States exports and increase the availability of raw materials.²⁶

In the face of possible developments, how is United States *commercial policy* likely to evolve over the next quarter century? Over the past 25 years, United States policy has been acted upon by two sets of powerful but opposing forces. On the one hand, have been those working toward a more liberal policy. These have recognized the position of the United States as a great creditor nation and its position of economic as well as political leadership in the free world. They have produced the Reciprocal Trade Agreements programme, and the substantial prewar and postwar tariff reductions; they have brought United States efforts in support of the International Monetary Fund, the International Bank for Reconstruction and Development, and the General Agreement on Tariffs and Trade. Working in the same direction have been the shortages which have developed in basic materials, bringing with them tariff reduction or elimination. In opposition are the forces of protectionism which, despite the losses that they have suffered, remain powerful. It may be suggested that protectionist pressure in the United States is increased by the vast size of the country and the regionalism within its complex economic whole. The organization of the federal government may give special opportunity for protectionist views to be heard and acted upon. But whatever the cause, the power is there, making itself felt in limitations to the field for further tariff reduction, in the rejection of the International Trade Organization and possibly in the rejection of the Organization for Trade Co-operation, in the continuation of administrative barriers to the entry of goods, in the introduction of escape clauses which may negate past tariff reductions, and in quota restrictions on agricultural imports. Devices for the protection of the standard of living of the farmer have brought large surpluses and their disposal in world markets through techniques regarded as unfair by other traders.

²⁶ "America Becomes a 'Have-not' Nation" by Peter F. Drucker in the April, 1956, issue of *Harper's Magazine*. See also the article cited earlier in the June 1955 issue of the same magazine.

Over the past 25 years, the United States has, nevertheless, become more internationally minded and its foreign economic policy generally much more liberal. Recently there has been a slowing down of progress in the tariff field and an increase of restrictions and export promotion devices affecting agricultural commodities. Over the next 25 years, it seems reasonable to expect the same play of forces as in the past, with the likelihood that there will be further progress but that such progress will be uneven over time and as regards the commodities affected.

Looking to the future, it would seem that United States leadership, which in the last few years has weakened in the economic sphere, must of necessity be re-established and that this will carry with it a further liberalization of commercial policy. Progress seems most likely in the materials field as dependence upon imports increases substantially and pressure groups insisting upon free access to external sources are built up and strengthened. Whether or not such materials will be allowed to enter more freely in semi-fabricated form presents a more difficult question. Here more resistance will be met, but there may well be some lowering of duties especially where total demand is growing rapidly, where weight losses in fabrication are important, where transportation and distribution considerations do not make market orientation more economic, and where the domestic source of the material is not within the same corporate entity or is not otherwise associated with the United States user.

Less progress can probably be expected in manufactured goods. Despite the many views in favour of lower tariffs which have been emerging, even among leading industrialists,²⁷ the arguments about the needs of national security and protecting the American worker from low-wage foreign competition will be brought out and listened to. Duty reduction, in all probability, will likely be fairly limited. Whether or not the Buy American Act is repealed or a specific Customs Simplification Bill is passed are questions of detail. In one way or another, it seems most likely that the United States manufacturing industry will continue to be protected. Yet, even here, the economic and political factors suggest a gradual lowering of barriers.

The pressures for special treatment of agricultural commodities seem now to be part of the United States political framework and the support of such treatment seems to be a necessity for political success. Thus, the groups favouring relative freedom from restrictions in other fields may also favour support to agriculture and the restrictions and surplus disposal programmes which this brings with it. As long as United States agricultural support programmes result in prices, in the market or to the farmer, which are above world levels, imports will almost certainly be restricted. If the goods are sold in the market at the support level, imports in excess of the amount, if any, by which domestic demand exceeds domestic supply would mean that

²⁷ Peter F. Drucker, article cited in the June 1955 issue of *Harper's Magazine*.

the government would have to purchase and hold larger amounts. If the market price is allowed to fall, imports would tend to force it down and increase the government losses on its operations. Techniques for limiting production, such as the current soil bank programme, will not facilitate imports of agricultural commodities. Under such arrangements, United States prices — market prices or effective prices to producers — will tend to remain high and thus continue the pressure for imports, which it will be deemed necessary to keep out lest they increase the magnitude of the problem of limiting production.

To the extent that the agricultural programme results in, or fails to prevent, the development of surpluses, there will remain the question of their disposal. External sales below support levels may be unpopular among other exporting countries. External sales below world prices or under special conditions, such as for inconvertible local currency which may be then loaned back to the "purchasing" country, will be especially unpopular. World opinion may induce the United States to limit such sales and to store at least part of its surpluses. But the existence of surpluses creates pressures and uncertainties in world markets. Recently, great concern has been indicated over reports that an undertaking to purchase United States wheat in the future has been a condition of the disposal of surplus wheat against local currency. It was also reported in October 1956 that \$5 billion of surpluses had been sold for local currencies, bartered and given away over the preceding three and one-quarter years. Together with other subsidized exports, this was stated to have accounted recently for 60% of all United States farm exports.²⁸

For the future, there remains the question of whether United States policy or world demand will develop so as to eliminate the problem of surpluses and their disposal. The limitation of United States production — if it is successful — should ease the problem. But its magnitude is such that its removal as a result only of this development seems unlikely, especially as no striking change in the broad general nature of United States agricultural policy is to be expected, at least for the foreseeable future. On the other hand, it is possible that a growth in world demand for at least some agricultural commodities will raise purchases sufficiently to remove the surplus problem. One great uncertainty here concerns sales to the U.S.S.R. and the extent and permanence of the Russian need. Another possibility is the expansion of food consumption in underdeveloped countries, particularly in Asia. Many of these areas, however, could themselves expand food production and the expansion of caloric intake, even where it is very low, would seem to be a slow process. There is a danger that increased sales of wheat, for example, would be at the expense of rice with serious economic consequences to the Burmese and Thai rice producers, consequences which the West would

²⁸ *The Financial Post*, Toronto, October 6, 1956. Subsequent reports have indicated that, in at least one case, the amount of the tied future wheat sales has been reduced below the figure in the original agreement (*The Financial Post*, January 12, 1957).

wish to avoid. If, however, the expanded market is to depend only upon the growth in population in North America and Western Europe, it seems unlikely that this will offset the effects of increasing agricultural productivity. It is probably necessary to count on a continuing, or at least recurrent, problem facing agricultural exports for some years to come, although hopefully a problem of gradually diminishing magnitude.²⁹

Despite the position of agriculture, United States policy is expected to be such as to permit a rapid increase in total imports, at a rate which may substantially exceed the rate of growth in Gross National Product. The increase in United States imports will mean a parallel increase in the dollar earnings of the rest of the world. In addition, it may be anticipated that military expenditures and foreign aid will continue to involve a substantial outflow of funds from the United States. The extent to which this will be augmented by the movement of private capital will depend in part upon political developments and on attitudes taken in developing countries. Over-all, however, it is expected that total transactions between the United States and the rest of the world will result in a continuing increase in the dollar resources held outside the United States.

(b) *The United Kingdom*

Even after adjustment for the diversion to the continent of wheat originally destined for the United Kingdom, the United Kingdom was still Canada's most important export market in each of the years 1933 to 1939, taking between 36% and 40% of total domestic merchandise exports (other than to Newfoundland). Since the war, however, the United Kingdom has taken substantially less than the United States and less than all other countries as a group. Compared with 22% of total exports in 1928 and 38% in 1937, the U.K. share of Canada's domestic merchandise exports dropped to 15% in 1950 and from 1951 to 1955 was 16% to 18%. Despite this decline, however, the United Kingdom market remains of great importance to Canada, accounting in 1955 for eight and one-half times the value of sales to the next most important market other than the United States.

Only modest growth is expected in the *population* of the United Kingdom over the next 25 years, with the size of the labour force remaining relatively stable. Projections for the population of Great Britain (*i.e.*, not including Northern Ireland) were contained in a report prepared under the direction of the Statistics Committee which assisted the Royal Commission on Population (1944-49).³⁰ On the basis of different projections concerning mortality, marriage rates, fertility and migration, 16 sets of projections were offered. Under eight of these, population would increase between 1947 and 1982 and, under the other eight, it would decrease — with the changes

²⁹ See also the discussion of the effects of the U.S. agricultural programme in the Commission's studies on agriculture and Canadian-United States economic relations.

³⁰ *Papers of the Royal Commission on Population*, Volume II, "Reports and Selected Papers of the Statistics Committee", London, H.M.S.O., 1950, pp. 213-301.

varying between an increase of 15% and a decrease of 5%. Only five of the 16 series showed an increase in the population between 15 and 65 years of age. Projections for intervening years, however, were in line with the moderate increases in total population which have occurred since the projections were prepared. More recently, a projection by the Government Actuary, with no adjustment for the possible effects of migration, suggested an increase of 5.2% between March 31, 1954 and March 31, 1979. Within this projection, only a 2.2% increase was shown for the ages 15 to 64. Alternative assumptions on mortality suggested that the range for the total increase might be between 2.8% and 7.3%.³¹ Other sources support the conclusion that the most reasonable expectation over the next 25 years is little change in the total population of the United Kingdom, with stability or perhaps some decline in the labour force.³²

In estimating the U.K. Gross National Product increase between 1950 and 1975, the Paley Report based its calculations on a 3% decline in the labour force, a 10% fall in the average number of hours worked, and an 85% increase in productivity per man-hour (2.5% per annum, the same as was assumed for the United States). These developments would result in an increase in G.N.P. of 62% over the 25-year period.³³ As regards the rate of growth in productivity per man-hour, it may be noted that, between 1948 and 1955, Gross Domestic Product in 1948 market prices rose by 23.9% or at a rate of growth of about 3.1% per year.³⁴ This includes the effects of changes in the labour force. Data in the *Economic Survey* for 1956, however, show that, over the same period, industrial production rose by 36% and employment in industry by 11%, so that output per man year went up by 23% — i.e., an increase in productivity in this sector of the economy at a rate of about 3.0% per year.³⁵

A forecast higher than in the Paley Report was contained in a staff paper prepared for the United States Joint Congressional Committee on the Economic Report.³⁶ There it was noted that the share of investment in the U.K. national product had been increasing since the war. Further,

³¹ *Report of the Committee on the Economic and Financial Problems of the Provision for Old Age*, December 1954, London, H.M.S.O., Cmd. 9333, Appendix II, especially pp. 101–103.

³² A recent O.E.E.C. study carried its projections only to 1971 and, while it showed total population increasing to that date it suggested a 10% decline in the population under 15 between 1961 and 1971 (*Demographic Trends in Western Europe, 1951–1971*, A Report by the Manpower Committee, Organisation for European Economic Co-operation, Paris, May 1956).

³³ *Paley Report*, Vol. II, p. 131, in chapter prepared by Arnold C. Harberger.

³⁴ Central Statistical Office, *National Income and Expenditure, 1956*, London, H.M.S.O., p. 9. Gross Domestic Product at 1948 market prices includes consumers' expenditure, public authorities' current expenditure on goods and services, gross domestic capital formation, and exports of goods and services less imports of goods and services including taxes on expenditure (at 1948 rates) levied on imports (or on withdrawals from bond). It does not reflect property income paid or received from abroad. The data also show that, from 1946 to 1955, Gross Domestic Product at 1948 market prices rose by about 28.7% or at a rate of about 2.8% per year. If Gross Domestic Product is valued at 1948 factor cost, the rate of increase shown is greater both from 1948 to 1955 and from 1946 to 1948.

³⁵ *Economic Survey, 1956*, London, H.M.S.O., Cmd. 9728, p. 16. Industrial production covers manufacturing, mining and quarrying, building and contracting, and gas, electricity and water (p. 13).

³⁶ *Trends in Economic Growth: A Comparison of the Western Powers and the Soviet Bloc*, a study prepared for the Joint Committee on the Economic Report by the Legislative Reference Service of the Library of Congress, U.S. Government Printing Office, Washington, D.C., 1955, p.213.

the share of investment devoted to agriculture was likely to diminish even more rapidly than since 1950, while desirable investment in services, especially education, would probably increase. Thus a continuation of the current rate of increase in productivity, 3% per year, appeared quite probable even over a long period.³⁷ Taking account of an expected decrease in man-hour input of 5% to 10%, this gave a possible rise in national product of 55% to 60% between 1953 and 1971. Projected for 25 years, this would be a growth of 84% to 92%.

With a population of less than a third of that of the United States, the United Kingdom absorbs almost as large a value of *imports*, over 12% of the 1955 world total outside the Soviet bloc.³⁸ Imports thus bulk fairly large relative to G.N.P. During the postwar period the importance of imports increased, until in 1951 they amounted to 27% of G.N.P. at factor cost (*i.e.*, valued before the deduction of subsidies and the addition of taxes on expenditure). In 1952 the percentage fell to 21 and in 1955 it was 20. Despite the fact that the 1955 volume of imports was only slightly, if any, higher than that in 1938, imports had been only 16% of G.N.P. in the prewar year, the increase in the percentage reflecting the more rapid increase in the prices of imported goods.³⁹

In the years 1952 to 1955, 40% to 45% of U.K. imports came from sterling area sources, as compared with 30% in 1937. Continental O.E.E.C. countries supplied 21% or 22%, about the same proportion as in 1937. Canada and the United States together supplied 17% to 20%, as compared with 20% in 1937.⁴⁰ In 1955, food, beverages and tobacco accounted for 37% of total imports, basic materials for 29%, mineral fuels and lubricants for 10.5%, and manufactures for 23%.⁴¹

In the past few years the United Kingdom has taken a number of steps in the field of *financial and commercial policy*, with the result that there has been a considerable reduction in the effective level of restrictions on imports. Important restrictions and discrimination still remain for many manufactured and agricultural commodities but the extent of relaxation, including relaxation affecting hard currency imports, has been significant, so that imports of raw materials and basic foodstuffs are now relatively free from restrictions.

Associated has been the restoration of a number of commodities to private trading and the reopening of commodity markets. Under the organized commodity market arrangements, the commodities may be re-exported or traded against sterling; in some (but not all) cases the

³⁷ At an earlier point in the study, there was a reference to the potential rate of growth of the U.K. national product as being forecasted at perhaps 2.6% per year (pp. 68-69).

³⁸ International Monetary Fund, *International Financial Statistics*, December 1956.

³⁹ Central Statistical Office, *National Income and Expenditure*, 1956, pp. 1 and 4; and *Monthly Digest of Statistics*, No. 128, August 1956, London, H.M.S.O., p. 84.

⁴⁰ International Monetary Fund, *op. cit.*

⁴¹ *Accounts Relating to Trade and Navigation of the United Kingdom*, December 1955, London, H.M.S.O.

re-export or trade against sterling is allowed even if the commodities were purchased for dollars. Also important was the extension of the Transferable Accounts system to cover all currently earned sterling except that accruing to the dollar area and the decision of the authorities to support the rate at which holders of transferable sterling could convert it into dollars in external markets.

In line with the increasing multilateralization of trade and payments has been the hardening of the E.P.U. payments mechanism. Net purchases from O.E.E.C. countries do not yet require full settlement in gold or dollars as do purchases from the dollar area. But, while 25% of net E.P.U. debits may be financed by credit, the question of the settlement of these debts will arise when the E.P.U. is terminated, if not earlier. A condition of the renewal of the agreement in 1954 was the conclusion of bilateral arrangements for the regular repayment or funding of a large part of the then outstanding debts, and the E.P.U. managing board has proposed that there should be further consolidation agreements and that debtor countries be urged to make further cash repayments to the E.P.U.

Another significant development has been the increasing use of fiscal and monetary policy by the United Kingdom to deal with balance of payments difficulties. Thus, while the central gold and dollar reserves declined by 30% between mid-1954 and the end of 1955, this was not met by an intensification of exchange and trade restrictions. While restrictions remain, including discriminatory restrictions favouring imports from the sterling area and O.E.E.C. countries, the progress made in their removal has been very substantial.

The establishment of the formal convertibility of sterling now appears to be much less imminent than in the past, *e.g.*, in the early part of 1954. In part, the delay may be attributed to the desire that the move should be taken when confidence in sterling is high, when the U.K. exchange reserves are rising. More recently, the preoccupation with European regionalism, discussed in Section II (e), suggests that sterling convertibility may be delayed indefinitely. The Suez crisis and the accompanying loss of reserves (which had increased in the first half of 1956) have created additional problems. Yet convertibility does remain the announced objective of U.K. policy, and it is accordingly relevant to consider what might be the effects — especially upon Canada — of this move.

Despite the amount of discussion about U.K. convertibility, the exact nature of the associated arrangements has never been made fully clear to the public. For example, it is not generally known whether the official exchange rate at which conversion would take place would be fixed or would be allowed to fluctuate, presumably within certain limits rather wider than the present spread of about 0.75% each side of parity. Probably more important are the questions which arise about the future of the remaining

restrictions and discrimination — quite apart from capital controls, and perhaps also the prescription of the currency of payment, which might be expected to remain.

It is generally anticipated that U.K. convertibility would concentrate on the establishment of facilities whereby all non-resident earners of sterling from authorized current transactions would be able to convert it into gold or dollars at the official exchange rate, *i.e.*, on what may be called “external” convertibility. Such a step might be taken before the elimination of all remaining restrictions and discrimination affecting imports. Thus the plan might envisage a transitional period of a year or more after C-Day during which restrictions and discrimination would be retained but gradually reduced. There may, however, be doubts that restrictions could be eliminated completely after this relatively short period. There might remain a hard core of restrictions which would continue into the indefinite future and perhaps involve some discrimination in favour of other countries of the sterling area and Western Europe. Apprehension on this score is based partly on the possibility of a fear that unrestricted imports from the dollar area, especially in consumers’ goods, could bring balance of payments difficulties, and partly on the strength of certain protectionist forces. As events develop, it might be that the removal of such restrictions would turn on the success of intra-European arrangements for freer trade in achieving their full objectives of increased efficiency and production.

One aspect of U.K. convertibility concerns the problem of preventing non-residents from making such demands for conversion that the arrangement breaks down. Clearly, if countries exporting to the United Kingdom chose to curtail their imports, for which they pay in sterling, and to present most of their sterling earnings for conversion, the United Kingdom would soon find its gold and dollar reserves reduced so low that convertibility would have to be abandoned. The best defence against such a run on sterling would be to make U.K. (and sterling area) goods sufficiently attractive in terms of price and other considerations that other countries would continue to import them even when the alternative was to convert sterling holdings into dollars to be used for purchases elsewhere. To some extent this alternative now exists, so that the dangers may not be too great. There have, however, been suggestions that the United Kingdom ought to enter into agreements with partner countries under which they would agree not to cut down sterling purchasing and perhaps to continue to hold part of their exchange reserves in sterling. The possibility and workability of such arrangements are, however, difficult to foresee in advance.

Related is the question of whether the dollar earners of the sterling area — notably Ceylon, Malaya, West Africa and the Union of South Africa — will continue to contribute gold and dollars to the central reserves. It would not be reasonable to assume that such contributions could

for long be offset by increases in sterling balances. Regardless of political arrangements which may exist among the members of the Commonwealth and Empire, United Kingdom access to this source of dollars will depend upon the ability of United Kingdom exporters to supply these areas with the goods which they want for consumption and for their development, at prices competitive with those of goods from other sources, and upon the ability of the U.K. capital market to provide funds for their development. If the United Kingdom can be competitive, such problems as may arise should not be insurmountable.

Differences of opinion may exist as to the nature of United Kingdom policy and the level of imports which would follow convertibility. On the one hand, it may be argued that the United Kingdom could, and would have to, free imports completely from all restrictions other than moderate tariffs and at the same time eliminate distortions in the economy created, for example, by domestic subsidies. Freer imports would reduce costs and, more important, expose industry to competition and force it to become more competitive — in export markets as well as in the home market. Imports from any source would, in effect, cost dollars, so that the remaining currency basis for discrimination would be removed. Further, could the authorities deny residents access to dollar goods at the same time that they provided dollars to non-resident earners of sterling? Such steps as the reduction of the subsidies might raise wages, but the removal of distortions would greatly reduce the relative attractiveness of the home market and force exporters to sell more of their production abroad. Under this argument, U.K. exports could be greatly increased and so make it possible to pay for an enlarged volume of imports. In addition to any direct benefits accruing, say, to Canada, a healthier, more viable, U.K. economy would mean a healthier world trading environment out of which indirect benefits would come.

On the other hand, it may be argued that changes of such magnitude cannot be envisaged. Large expenditures on social services are likely to continue and the maintenance of full employment to remain at the heart of economic policy. Thus, the likelihood of a relative deflation of the U.K. cost structure may be held doubtful, so that the attractions of sales in the home market would persist. As raw materials may now be imported relatively freely, most of the beneficial effects on exports from cheaper materials due to the removal of restrictions have already been achieved. Further, in the export of manufactures, the United Kingdom faces a situation in which the United States has a considerably larger share of trade than before the war, and Germany and Japan having been far below prewar levels, are rapidly increasing their shares. In these circumstances, it is held that convertibility could not be expected to be accompanied by a significant increase in U.K. exports with which to pay for larger imports.

Such conclusions about export prospects received some support from a 1955 analysis published by the U.K. Treasury which showed that the United Kingdom had not maintained its position, as compared with 1938 or 1948, either in trade between primary producers and manufacturing countries or in the more rapidly expanding trade among manufacturing countries. Continental Europe accounted for most of the increase in world trade between 1948 and 1954. Considering the exports of manufactures by 11 main exporting countries, the United Kingdom had 22% of the total in 1937, 26% in 1950 and 20% in the period October 1954 to March 1955 (excluding United States special category exports). Between 1952 and 1954, Germany's exports of manufactures increased more to every area than did those of the United Kingdom; even to the rest of the sterling area, the increase was greater. In the much more important expansion of European imports, Germany obtained a much larger share than did the United Kingdom.⁴²

Similarly, an article in the *Board of Trade Journal* reported that, between 1953 and 1955, the volume of West German exports rose by 40% and Germany's share of world trade in manufactures rose from 13.3% to 15.6%. Over the same period, the U.K. export value rose by 13% and the U.K. share in world manufactured exports fell from 21.3% to 19.8%. This movement was not the result of any special privileges enjoyed by German industry. On the other hand, it would appear that productivity had been increasing faster in the Federal Republic than in the United Kingdom. Labour costs per unit of output had dropped in Germany, whereas in the United Kingdom they had increased. Another factor noted was the higher proportion of national product devoted to industrial investment in Germany. No early or significant change in the existing relationship between costs of production was foreseen.⁴³

For the future, U.K. exports and exchange earnings generally will undoubtedly continue to grow. This will mean an increase in the ability to import, and to import from the dollar area. There will, however, remain the basic problem of living within foreign exchange availabilities. Imports will have to be limited to this level whether through restrictions or through fiscal and monetary controls. In a world where the export of manufactures is facing increasing competition from other suppliers and restrictions by those seeking to industrialize, it seems unlikely that there could be a sudden very marked increase in U.K. exports accompanying convertibility.

A successful move to convertibility, however, must be based upon an underlying strength in the economy which will enable British goods to be

⁴² *Bulletin for Industry*, A Monthly Review of the Economic Situation Prepared by the Information Division of the Treasury [of the United Kingdom], Number 76, September 1955.

⁴³ *Board of Trade Journal*, London, H.M.S.O., July 28, 1956, pp. 173-181.

For an analysis of the longer-term decline in the U.K. share of world exports of manufactures, see H. Tyszynski, "World Trade in Manufactured Commodities, 1899-1950", in *The Manchester School of Economic and Social Studies*, September 1951.

competitive both at home and in export markets. An important precondition for such strength is the control of inflationary forces. The establishment of freer trade and payments relations and the accompanying increase in competition should enable trade to increase. Such developments are the more likely to the extent that the control which may have to be exercised is through monetary and fiscal restraints. Further, a country's external economic position can remain viable only if the over-all objectives which it sets for itself are realistic, and there are indications that U.K. commitments are to be tailored to foreign exchange availabilities. Over the long run, increasing competition arising from closer trade relations with Continental countries, particularly Germany, should exercise pressures to keep costs competitive and to keep claims upon resources within the same sort of limits as apply to competitors. A soundly based convertibility and the removal of restrictions could contribute to the long-term strengthening of the British economy and thus to a significant growth in exports and in the ability to import.

(c) *Continental Western Europe*

The increase in the proportion of Canada's exports to the United Kingdom in the 1930's and to the United States in the postwar period has meant a substantial decline in the importance of continental Western Europe as an export market. On the basis of data adjusted for the diversion of wheat, the present Continental members of the O.E.E.C. in 1928 took 26% of Canada's domestic merchandise exports to all destinations except Newfoundland (a rather higher percentage than in both preceding and subsequent years). In 1955 these countries took only 8% of Canada's exports or about the same percentage as in 1937. The most important Continental markets in 1955 were the Federal Republic of Germany, ranking fourth among destinations for Canada's exports, followed by Belgium-Luxembourg, the Netherlands, Norway, France, Italy and Switzerland.⁴⁴

The general expectation appears to be that Western Europe will experience a moderate growth of *population* over the period 1955 to 1980, although the growth will probably be heavier in less prosperous parts of the area. A relatively high estimate of 21% may be obtained from a United Nations study. The authors of this study, however, put forward their estimates by countries subject to considerable qualification.⁴⁵ In the study prepared for the United States Joint Congressional Committee on the Economic Report, the population of all members of the O.E.E.C. was projected as growing from 280 million at the end of 1953 to 302 million by about 1970.⁴⁶ Making

⁴⁴ In the first 11 months of 1956, the Federal Republic of Germany was Canada's third most important export market, accounting for almost 3% of the total.

⁴⁵ United Nations Population Division "Framework for Future Population Estimates, 1950-1980, by World Regions", published in *Proceedings of the World Population Conference, 1954, Papers: Volume III* (United Nations document E/CONF. 13/415), pp. 283-324. The figure of 21% is obtained from Table II in Annex B which contains estimates by countries based on the "medium" assumption. The countries covered include the whole of Germany. Reference should be made to the study for the numerous qualifications noted by the authors.

⁴⁶ *Trends in Economic Growth* (cited in footnote 36.), p. 6.

a rough adjustment for the United Kingdom, Ireland and Iceland, this would suggest about a 9% increase for continental Western Europe, or about 13% if the rate of growth is projected over 25 years. The more recent study by the O.E.E.C. covered its member countries other than Iceland and Turkey. If an adjustment is made to exclude also the United Kingdom and Ireland, the result would appear to be an estimate of about a 12% increase between 1951 and 1971, or about 15% over 25 years — based upon the average assumption excluding migration.⁴⁷ Similarly, the Paley Report suggested a 13% increase between 1950 and 1975 in the population of age 15 to 64 in “free Europe” (excluding the United Kingdom, Iceland, Ireland and Turkey, but including Finland, Spain and Yugoslavia).⁴⁸

To estimate the change in Gross National Product of the countries included in “free Europe”, the Paley Report again assumed a 2.5% per annum increase in productivity per man-hour. This, together with a 14% increase in the labour force and a 10% decline in the average hours worked, yielded a 90% increase in G.N.P. between 1950 and 1975.⁴⁹

The authors of the study prepared for the United States Joint Congressional Committee felt that, because of the numerous factors involved, no aggregative forecast appeared possible for the Western European economies. For Norway, Sweden and the Netherlands (as well as for the United Kingdom) forecasts of continued growth appeared justified on both historical and structural grounds. Stormy economic histories and present-day difficulties, however, created uncertainty as to the future of the other countries. For example, France was seen as having many conditions favouring rapid economic growth, including unused agricultural capacity, manpower reserves in agriculture and handicrafts, and rapidly rising productivity in manufacturing. At the same time, low productivity and insufficient output in agriculture, plus a chronic financial overcommitment of the government inducing recurrent inflation, were severe barriers to progress. Postwar recovery in Western Germany had been remarkable but it had been accomplished largely by rapid increases in labour input made possible by immigration, and by favourable terms of trade made possible by low wages and limited consumption. Productivity had risen slowly and equipment was far from modern. Should labour demand a greater share of the national product, Germany's competitive position in foreign trade and its pattern of growth might be seriously endangered. Yet, should Germany restrain domestic demand, its vulnerability to fluctuations in world trade would remain extremely great.⁵⁰

⁴⁷ Manpower Committee, O.E.E.C., *Demographic Trends in Western Europe, 1951-1971* (cited in footnote 32), pp. 21-23, and 51.

⁴⁸ *Paley Report*, Vol. II, p. 131, in chapter prepared by Arnold C. Harberger. For “all free Europe”, the forecasted increase of population between 1948 and 1970-79 was 10% (*Paley Report*, Vol. V, p. 59, in a study by the Forest Service of the U.S. Department of Agriculture).

⁴⁹ *Ibid.*, Vol. II, p. 131.

⁵⁰ *Trends in Economic Growth*, pp. 68-69.

Continuing favourable developments in the Federal Republic may call these views somewhat into question. As noted in the previous subsection, these include the decline in labour costs per unit of output and the relatively large proportion of G.N.P. devoted to industrial investment. Although wages may now be rising more rapidly than productivity, this has not yet produced a noticeable impact on prices; and consumption, as well as investment, has been rising despite the growth in exports.⁵¹

The countries of continental Western Europe bulk large in the world's trade, taking a larger share of total *imports* than the United States and the United Kingdom together. In 1955, these countries took about 31% of the world total outside the Soviet bloc. A significant amount of this trade, however, takes place within the region; in 1955 they obtained 44% of their imports from each other. On this basis, it may be roughly estimated that, if these countries are treated as a unit and trade among them is not considered as part of the world total, they purchased almost 20% of world imports, again excluding the Soviet bloc, as compared with 16% by the United States. Of these imports, about 13% came from the dependencies of the countries involved, 33% from the sterling area, 26% from the United States and Canada, and 11% from Latin America.⁵²

The largest importers in the group are the Federal Republic of Germany, France, the Netherlands, Belgium-Luxembourg and Italy. For the two largest importers, Germany and France, imports (c.i.f.) constitute a relatively small proportion of G.N.P. — about 15% and 10%, respectively, in 1955. Imports were also relatively unimportant in Italy and Turkey (1954 data). In the case of the Netherlands, however, imports, again on a c.i.f. basis, were over 40% of 1954 G.N.P. Other countries occupied positions between these extremes.⁵³

In the field of *financial and commercial policy*, the countries of continental Western Europe have, like the United Kingdom, made significant strides in the past few years. Some of these countries have from time to time experienced difficulties and programmes of liberalization have been interrupted. In general, however, exchange reserves have increased, sometimes very rapidly, and restrictions affecting imports have been relaxed. At first, the relaxation affected mainly trade among the O.E.E.C. countries themselves, sometimes extended to other soft currency countries. In any

⁵¹ Board of Trade Journal, *op. cit.*; and United Nations, Economic Commission for Europe, *Economic Bulletin for Europe*, Geneva, August 1956, pp. 1-24.

⁵² International Monetary Fund, *International Financial Statistics*, December 1956.

⁵³ *Ibid.* These percentages are not fully comparable to those given above for the United States and the United Kingdom. A set of estimates for 1952 based on O.E.E.C. data was contained on page 179 of *Trends in Economic Growth* and showed imports as generally rather higher percentages of G.N.P.

Austria.....	20	Netherlands.....	46
Belgium.....	40	Norway.....	43
Denmark.....	30	Portugal.....	22
France.....	15	Sweden.....	23
Germany (Fed. Rep.).....	16	United Kingdom.....	25
Greece.....	16	Canada.....	23
Italy.....	16	United States.....	4

event, it was discriminatory against the dollar area. More recently, the liberalization has been more and more extended to the dollar area and there has been an increasing freedom for capital as well as current transactions. Western European countries have also increased the transferability of their currencies among residents of other soft currency countries and have permitted their own residents greater freedom in holding foreign currencies and purchasing foreign securities. In the Federal Republic of Germany, the freeing of gold imports and the establishment of a free domestic gold market, the permission to exporters to retain abroad the proceeds of their sales, the granting of the right to residents to purchase foreign securities and the further liberalization of dollar imports had, by mid-1956, given German residents close to complete "internal" convertibility. Much the same situation existed in Switzerland and Belgium-Luxembourg, and important steps had been taken by the Netherlands and, to a less extent, by Portugal and France. Elsewhere in Western Europe there had also been substantial progress in liberalization and in the simplification of exchange structures, although no Continental currency was as freely negotiable or transferable among non-residents as was sterling.

Further progress toward convertibility on the Continent, and especially the final step, may now be delayed by the exigencies and uncertainties associated with the development of a tighter and more permanent European regional arrangement. This would appear to be especially so if, despite the strength of some Continental currencies, their convertibility continues to await that of sterling. As with the United Kingdom, however, convertibility remains the announced aim and it is useful to consider the future in terms of the effects of this step.

For some time, it has been expected that a convertibility move by the United Kingdom would immediately be followed by action at least on the part of the Federal Republic of Germany, Belgium-Luxembourg and the Netherlands. Action by other countries is less certain, but it might be taken by some. The Scandinavian countries might wish to retain relatively close ties with sterling. In the case of France, there have been suggestions that the franc would quickly follow sterling to convertibility. While complete data are not available, it is apparent that French exchange reserves rose sharply during 1954 and 1955, although they have declined in subsequent months. The favourable position, however, was due in large measure to current receipts on government account from NATO partners and to official grants from the United States. France still found it necessary to compensate for the overvaluation of the franc by a system of taxes and other restrictions, subsidies and tax remissions to exporters.

The nature of the convertibility move by Continental countries might differ from that of the United Kingdom. It has been suggested that the first goal of at least some countries on the Continent would be something akin

to the Swiss system, a state which may be called "internal" convertibility. In this, the initial emphasis would be placed on freeing imports from restrictions other than tariffs and on establishing convertibility arrangements only with those countries which also maintained convertibility. Settlements with other countries would continue to be restricted, perhaps on a bilateral basis through payments agreements. Part of the motivation for proposals of this nature is a desire to protect markets in countries unwilling to trade on a convertible basis. In some cases, the exports to be encouraged might be difficult to move in the absence of special arrangements.

A question may arise as to what incentives countries becoming convertible in this sense would be able to offer bilateral partners. To the extent that special licensing arrangements were involved, this would mean restrictions running counter to the general policy. Apart from this, however, special credits might be offered to partner countries, *e.g.*, long-term credits or credits through the swing provisions of payments agreements. One suggestion has been that the currencies of certain partners might be traded in free markets where they could go to a discount sufficient to balance receipts and payments. Recent trends, however, have been away from such arrangements.

Convertibility of Continental currencies would, of course, not mean the end to barriers to trade resulting from the forces of protectionism. The same forces leading to the desire to protect export markets for certain industries may be expected to lead to demands for protection against imports. If European countries are adjusting to increased competition among themselves, they will be all the less willing to reduce barriers against extra-regional competitors and there will be pressures to increase them. While some Continental countries have comparatively low tariffs, many relatively inefficient industries receive substantial tariff protection and such protection may be expected to continue to put significant barriers in the way of imports from outside the region. Further, it would not seem realistic to suggest that there will be a complete removal of restrictions other than tariffs, even under a system of internal convertibility. Where balance of payments difficulties persist or recur, as may be the case for some countries, such restrictions will be more severe.

Much has been heard about "hard core" restrictions which countries have felt that they must retain, particularly on agricultural commodities, after the balance of payments justification for their restrictive systems had disappeared. Reference has been made above to arrangements for non-discriminatory five-year waivers agreed by the CONTRACTING PARTIES to the GATT in connection with such restrictions.⁵⁴ Behind these arrangements was the notion that the industries in question could adjust within a limited period to the situation which would prevail if the restrictions were removed. Yet it may be that the agricultural policies and problems of Western Europe are

⁵⁴ See Section II (b) of this chapter.

such that it is more reasonable to assume the more or less permanent continuance of this sort of protection. Already the CONTRACTING PARTIES have found that their "hard core" decision did not go far enough to meet the desires of Belgium and Luxembourg — although the December 1955 decision granted in favour of Belgium called for the elimination of the restrictions within seven years. The interest of certain Continental countries in the "hard core" problem and "the difficulties that may be expected to be involved in the harmonization of the agricultural policies of the members of the Benelux Customs Union"⁵⁵ raise doubts about the complete inclusion of trade in agricultural commodities under the proposed customs union arrangements. Quite apart from this, however, continuation of some restrictions against non-regional suppliers would seem likely.

The existence of agricultural protectionism on the Continent must not obscure the fact that these countries have been important importers of agricultural commodities. In 1952, Canada's seven most important Continental customers⁵⁶ imported from Canada \$165 million of wheat and wheat flour and \$83 million of barley, oats and rye, or 22% and 36%, respectively, of total domestic exports of these commodities. Although Canada's total domestic exports to the seven countries reached a peak in 1952, wheat and flour accounted for 40% of the total and coarse grains for 20%. In 1955, wheat and flour accounted for only 27% of Canada's exports to these destinations, and coarse grains had dropped to 3.5%. But these exports were still 22% and 12%, respectively, of the commodity totals to all destinations. In addition, the decline was in small part offset by a rise in the export of seeds to these countries to \$21 million, 42% of exports to all destinations.

It seems unlikely that the creation of an intra-European customs union and free trade area would have a marked effect upon the prospects for Canada's agricultural exports. Nor would it be likely to have much effect over the long run on Canadian shipments of forest products and base metals.⁵⁷ For a time, the improved competitive position of Scandinavia might injure Canadian prospects, but increasing demand must surely outrun this source. While there is the possibility of overseas territories receiving preferential treatment, the necessity of competitive efficiency argues against substantial barriers against any imports. It is in manufactures, however, that new European arrangements might have the most significant effects upon imports from the outside. While Canada has exported significant quantities of such items as engines and boilers and motor vehicles to the Continent during some postwar years, it is in the chemical field that most enduring progress

⁵⁵ CONTRACTING PARTIES to the General Agreement on Tariffs and Trade, *Basic Instruments and Selected Documents*, Fourth Supplement, Geneva, February 1956, p. 24 (in the decision granting a waiver to Belgium).

⁵⁶ Belgium-Luxembourg, France, the Federal Republic of Germany, Italy, the Netherlands, Norway and Switzerland.

⁵⁷ In 1955, planks and boards, pulpwood, woodpulp and newsprint accounted for 8% of Canada's exports to the seven countries listed in the previous footnote; asbestos, aluminum, copper, lead, nickel, zinc and iron ore accounted for 30%.

has been made. In 1955, exports of chemicals other than fertilizers (and uranium), but including synthetic rubber, amounted to \$31 million or 9.2% of exports to the seven countries and about one-fifth of the total of these exports to all destinations. The regional arrangement might well result in such exports growing less rapidly than would otherwise be the case. By and large, however, significant basic modifications in the present trading pattern would not appear to be likely, even after the convertibility of major Continental currencies.

(d) *Australia, New Zealand, and the Union of South Africa*

These three countries differ from most other non-European members of the sterling area in that, while they are undergoing development, they do not consider themselves to be underdeveloped countries.

Following the Ottawa Agreements of 1932, Canada's exports to these countries as a group rose in value by almost 50% between 1928 and 1937 and approximately doubled as a percentage of total exports. Thus they accounted for over 6% of domestic merchandise exports to all countries other than Newfoundland in the latter year. In 1947, the share was almost the same, but since that time there has been an absolute decline in exports to each of the three countries, so that in 1955 they took little more than 3% of total domestic exports — about the same proportion as in 1928.

Of the \$137 million of exports which Canada sent to these destinations in 1955, about \$58 million went to Australia, \$56 million to the Union of South Africa and \$22 million to New Zealand. Although these exports were well above the values achieved in 1954, each country had in the past taken larger absolute amounts — the largest being \$83 million by South Africa in 1948, just before the intensification of restrictions by that country.

Between 1937 and 1955, the *population* of Australia rose by 35% to 9.2 million, that of New Zealand by 35% to 2.1 million, and that of the Union of South Africa by 39% to 13.7 million. These rates of increase compare with 38% for Canada over the same period.⁵⁸ For the future, one estimate has suggested that, without immigration, the population of Australia would increase by 19% between 1956 and 1976 or by about 25% over 25 years. Assuming net immigration of 100,000 per annum, about the average rate for the period 1948 to 1953, the projection was for an increase of 47% between 1956 and 1976 or about 61% for 25 years.⁵⁹ Subsequently, the Australian Government has announced that its aim was to be net immigration of 1% of population per annum,⁶⁰ which would soon exceed the above

⁵⁸ United Nations, *Monthly Bulletin of Statistics*, December 1956. Data for Australia exclude full-blooded aborigines.

⁵⁹ J. N. Lewis and E. A. Saxon, "Agricultural Output Requirements for Future Population Growth in Australia", in *R.E.M.P. Bulletin*, Research Group for European Migration Problems, The Hague, January-March 1955 (reprinted from *Quarterly Review of Agricultural Economics*, Vol. VII, No. 4, 1954, Canberra). See also W. D. Borrie, "Economic and Demographic Aspects of Post-war Immigration to Australia", in the same issue of *R.E.M.P. Bulletin*.

⁶⁰ Extract from the Acting Prime Minister's Budget Speech, Canberra, August 30, 1956.

assumption of 100,000. An official New Zealand projection suggested that that country's population might grow by 52% between 1952 and 1977, under the apparently reasonable assumption of net immigration of 5,000 per annum.⁶¹ For South Africa, a study taking no account of migration projected the total population as growing by 59% between 1950 and 1975. In the course of this growth, the European element of the population would decline from 21% to 18%.⁶²

The Paley Report did not project Gross National Product for the Union of South Africa. For Australia and New Zealand, its calculations yielded a projected increase of 158% between 1950 and 1975. This was based upon a 64% increase in the labour force (57% in population), a 15% decline in average hours worked and the usual 85% increase in productivity per man-hour (2.5% per annum).⁶³ The economies of each of the three countries have developed fairly rapidly in the postwar period with expansion in both primary and secondary industry. Development has in part been based upon the importation of capital, but from time to time inflationary pressures have created difficulties.

Each of the economies is in considerable measure dependent upon the export of basic materials. Fluctuations in prices, especially of wool which is the most important export of both Australia and New Zealand, have introduced a significant element of instability both to the domestic economy and to the balance of payments. While South Africa is also an important wool exporter, wool bulks less important in the total economy which relies more heavily on such commodities as gold and uranium. Barring any violent non-economic upset, it would seem that each of these countries should continue to achieve a rapid rate of growth if they have reasonably favourable markets for their exports. Inflationary tendencies may, however, create difficulties in some quarters and the rate of expansion will be affected by the levels of capital import and immigration.

International trade is important to each of the countries. Together they accounted in 1955 for 5% of total *imports* by countries outside the Soviet bloc. In the most recent periods for which data are available, imports on a f.o.b. basis were 16% of Australia's G.N.P., 24% of that of New Zealand, and 32% of national income in the Union of South Africa. The United Kingdom is the most important source of imports for each of the three countries and significant supplies are also obtained from other sterling area sources. But the importance of sterling area sources varies considerably, accounting in 1955 for 74% of New Zealand's imports, for 57% of those of Australia, and for 45% of those of the Union of South Africa. From

⁶¹ New Zealand Census and Statistics Department, *Population Projections*, Supplement to December 1953 issue of *Monthly Abstract of Statistics*, Wellington, Government Printer.

⁶² L. T. Badenhorst, "The Future Growth of the Population of South Africa and its Probable Age Distribution", in *Population Studies*, June 1950, The Population Investigation Committee, London.

⁶³ *Paley Report*, Vol. II, p. 131, in chapter prepared by Arnold C. Harberger.

Continental O.E.E.C. countries, the percentages were 8 for New Zealand, 14 for Australia and 18 for South Africa. Thus, South Africa had the greatest dependence on the United States and Canada, from which it obtained 25% of its imports, while Australia got 15% and New Zealand 12% from these sources.⁶⁴

The *commercial and financial policies* followed by the three countries under consideration have varied with the circumstances in which they found themselves. Each has experienced balance of payments difficulties during the postwar period and has met these in part through the use of relatively comprehensive and severe systems of discriminatory restrictions. In the last few years, attempts to relax these restrictions have met with varying degrees of success.

Effective January 1, 1954, the Union of South Africa abolished discrimination between hard and soft currencies in the application of restrictions on imports, issuing licences valid for purchases from any country.⁶⁵ The licensing system, however, remained complex, with imports divided into a number of categories receiving different treatment. Subsequently, liberalization has continued with the granting of increased exchange allotments, and the South African authorities have indicated their expectation that remaining restrictions could soon be eliminated. Indeed South Africa has become one of the strong advocates of the elimination of non-tariff barriers to international trade.

New Zealand also has succeeded in reducing the severity of restrictions and the discrimination in their application. There has been an increase in the number of items which may be imported from any source without the necessity of a licence. Also a more liberal attitude has been taken toward the licensing of imports of essential items, such as industrial raw materials, from hard currency countries. On the other hand, licences for the importation of automobiles and commercial vehicles from all sources were one-third less in 1956 than they were in 1955. Although the import licensing schedule for 1957 showed no major changes from the previous year, New Zealand has been making increased use of fiscal and monetary controls to restrain demand.

In 1953 and 1954, restrictions affecting imports from non-dollar countries into Australia were relaxed in several stages. With a worsening balance of payments position, however, a ceiling was placed on various non-dollar imports previously allowed free entry and, in April and October, 1955, restrictions were again intensified. The action in April did not apply to dollar imports; that of October affected both categories. With the October intensification, however, it was announced that certain basic materials — including pulp, newsprint, aluminum, nickel, copper, and asbestos — would

⁶⁴ International Monetary Fund, *International Financial Statistics*, December 1956.

⁶⁵ This change did not appear to result in a significant increase in the share of imports from the dollar area. The percentage of the total coming from the United States and Canada was 23 in 1937, 25 in 1952, 23 in 1953, 23 in 1954 and 25 in 1955. Latin America supplied 1% in each of these years. (*Ibid.*)

henceforth be licensed on a non-discriminatory basis. This may have represented a significant change in Australian policy, Australia (and New Zealand) having tended to express a much more restrictionist policy than South Africa. Despite the introduction in March 1956 of new fiscal and monetary measures to counteract inflationary pressures, however, Australia again intensified restrictions in July 1956. In part, this affected only soft currency supplies, but the cut in automobiles and chassis also applied to imports from the dollar area. Subsequently, the balance of payments position improved, and somewhat relaxed restrictions went into effect on January 1, 1957.

Australia, New Zealand and the Union of South Africa all grant preferential treatment to other members of the Commonwealth through their tariff structures. Particularly after the Ottawa Agreements of 1932, the preferences facilitated a number of Canadian exports to these markets, automobiles being an often-cited example. The significance of these preferences has been decreased in the postwar period by negotiated reductions in the margins, and by increases in price which reduced the *ad valorem* equivalent of specific margins. Yet the system remains. Its significance for Canada, however, has been further limited by the discrimination in import licensing against the dollar area. Thus Canadian exports to the three countries have not kept pace with the over-all growth of exports. Yet Australia and South Africa have, with minor exceptions, been the most important markets for Canadian automobile exports in the postwar years and, in 1955, the three countries took 78% of the total of such exports — a total which, however, was less than 50% above the 1937 level in value terms.

In considering the possible effects of a European free trade area upon these countries, and assuming that they would remain outside such an arrangement, it is relevant to recall the high concentration of their exports on agricultural commodities and on the United Kingdom. To this extent, they would not experience harmful effects if a condition of U.K. participation was the exclusion of trade in agricultural products. New Zealand has both the highest proportion of agricultural exports and the highest proportion going to the United Kingdom. South Africa, however, would not be adversely affected in its important exports of gold, uranium and diamonds. Nevertheless, each of the three countries sells more of its merchandise exports in continental Western Europe than does Canada; in 1955 such sales accounted for 22% of Australian exports, 21% of those by the Union of South Africa (excluding gold), and 17% of those by New Zealand. Thus export prospects could be damaged, at least in the short run, especially if trade in agricultural commodities were put on a tariff-free basis among Continental countries.

A move to the convertibility of sterling by the United Kingdom would not need to bring major changes in the sterling area arrangements. Members of the area would presumably continue to hold most of their exchange

reserves in sterling.⁶⁶ If the sterling-dollar exchange rate were allowed to fluctuate, within relatively narrow limits, the currencies of other sterling area countries might be expected to move with sterling rather than to maintain a fixed exchange rate with the United States dollar.

The granting of formal convertibility to their reserve currency need have little effect upon sterling area countries. Under the present arrangements, it is maintained that their sterling holdings are convertible into gold or dollars upon demand. Membership in the club, however, involves a gentleman's agreement that each will pursue policies designed to limit access to the pool of gold and dollars, *i.e.*, to the central reserves held by the United Kingdom. Presumably this same situation would be expected to continue after convertibility.

In the outer sterling area, as in the United Kingdom, convertibility would increase certain pressures to eliminate restrictions and particularly their discriminatory application. Purchases from any market would in effect cost dollars and there would be increased pressures to buy in the cheapest market. Further, it would become increasingly difficult to deny residents access to dollars once trade was conducted in a convertible currency.

Even under convertibility, however, it seems likely that protectionism and balance of payments instability would limit the extent to which restrictions would be relaxed. Each of these countries is in a stage of rapid economic development, and policies aimed at the development of local manufacturing industry (*e.g.*, pulp and paper in New Zealand and automobiles in Australia) will undoubtedly restrict the movement of Canadian exports which developed within the Commonwealth preference system. The possibility of recurrent balance of payments difficulties associated with dependence upon exports of such commodities as wool may delay further liberalization. In recent years, Australia, particularly, has exhibited a tendency toward inflation which has been found difficult to control. The possibility of the continuation of these inflationary tendencies into the future cannot be dismissed.⁶⁷ Somewhat the same dangers face New Zealand, although there they do not seem to be as severe. The strength of the South African export position makes possible the hope that more progress can be made by that country, although protection for industries which have developed under the shelter of restrictions is a factor and it is possible that there may be some replacing of exchange and trade restrictions by tariff increases. According to public pronounce-

⁶⁶ The Union of South Africa, as the world's largest gold producer, has a unique position in the sterling area and holds more gold than foreign exchange in its official reserves. At the end of June 1956, gold holdings amounted to U.S. \$215 million and foreign exchange to the equivalent of \$109 million. For Australia (official and banks) the figures were \$164 million in gold and \$631 million in exchange, and for the Reserve Bank of New Zealand \$33 million in gold and \$224 million in foreign exchange. In each case, the foreign exchange holdings were mostly in sterling. The New Zealand trading banks also held such assets amounting to the equivalent of \$72 million. (International Monetary Fund, *International Financial Statistics*, December 1956.)

⁶⁷ The president of the Australian Associated Chambers of Manufactures was reported to have stated that the progressive weakening of the purchasing power of the Australian pound had placed the country in a precarious situation. Australian cost levels were seriously out of line with every other country in the sterling area. This situation arose from shortening hours and the continuous rise in wages and allied costs. (*The Financial Times*, London, December 7, 1955.)

ments about the removal of restrictions, it would appear that relaxation is tied to the financial position of the Union rather than to the timing of sterling convertibility.⁶⁸

(e) *Japan*

In 1955, Japan took 2.1% of Canada's domestic merchandise exports, a somewhat smaller share than during the prewar period and in the years 1952-54. Although the share of the total was relatively small, Japan was Canada's third most important export market in the period 1952 to 1955. In the first 11 months of 1956, the Japanese share rose to 2.7%, but the more rapid increase in sales to the Federal Republic of Germany reduced Japan to fourth place. In 1955, wheat, wheat flour and barley accounted for 66% of Canada's sales to Japan, as compared with 8% in 1937.

The population of Japan increased from 70 million in 1937 to 89 million in 1955.⁶⁹ The forecast by the United Nations suggested about the same rate of growth from 1955 to 1980, with an estimate of 126 million by the latter year.⁷⁰ Other projections have suggested a slower rate of increase. In 1954, the Director, Population Problems Research Institute, in the Japanese Ministry of Welfare — ignoring migration but assuming, *inter alia*, a continued decline in the birth rate — forecast that the population in 1980 would be 105 million, and that it would reach a peak of 107.2 million in 1990.⁷¹ Subsequently it has been reported that Japanese officials have raised the 1990 anticipated peak to 108.5 million.⁷² For its purposes, the Paley Commission employed a rate of increase of 33% between 1950 and 1975. If applied to the 1955 level, this would imply a population of 118 million in 1980.⁷³

Looking at Gross National Product, the Paley Report assumed that Japanese productivity per man-hour would rise more rapidly than in other developed countries owing to the under-utilization of productive capacity in 1950. Thus, between 1950 and 1975, productivity per man-hour was projected as rising by 121% (or 3.2% per annum). Average hours worked were not expected to fall, Japanese workers having much to gain before attaining a consumption level equal to that prevailing in other industrial countries. These assumptions, together with that of a 45% increase in the labour force, yielded a projection for G.N.P. in 1975 at a level over three times that in 1950.⁷⁴

⁶⁸ For example, it was reported that the Minister of Economic Affairs stated in November 1955: "I have this week-end been able to relax import control on a further range of goods, and will continue to lift control as and when the country's reserves warrant it. I hope to be able to relax control completely by 1957." (*The Financial Times*, London, November 29, 1955.)

⁶⁹ United Nations, *Monthly Bulletin of Statistics*, December, 1956.

⁷⁰ United Nations Population Division "Framework for Future Population Estimates, 1950-1980, by World Regions". See footnote 45.

⁷¹ Ayanori Okazaki, *The Present and Future of Japan's Population*, paper submitted to the Twelfth Conference of the Institute of Pacific Relations held at Kyoto, Japan, September-October 1954, Japan Institute of Pacific Relations, Tokyo, 1954.

⁷² *The Gazette*, Montreal, October 22, 1956.

⁷³ *Paley Report*, Vol. II, p. 131, in chapter prepared by Arnold C. Harberger.

⁷⁴ *Ibid.*

The value of any projection made on the basis of 1950, however, is very considerably reduced by the fact that, in that year, production had incompletely recovered from the effects of the war. Subsequently, there have been enormous increases. In 1950, manufacturing production was still 38% below 1937. Between 1950 and 1955, the index rose by 133% or to 45% above the 1937 level. Growth continued during the first nine months of 1956. The index of mining production rose 22% between 1950 and 1955, when it stood at the same figure as in 1937, and it went on to higher levels in 1956. G.N.P. rose from 3,971 billion yen in the fiscal year 1950 to 7,359 billion yen in fiscal 1954.⁷⁵ A considerable rise in Japanese prices accounted for part of the increase in national product. Most of the price rise, however, took place between 1950 and 1951; between the fiscal 1951 and fiscal 1954, a period over which there was little price change, G.N.P. rose from 5,541 billion yen to 7,359 billion yen or by 33%.⁷⁶

Postwar production increases have been notable in machinery, chemicals, metals, rubber and leather. Textile production has increased but, at least up to the first quarter of 1955, was still below the prewar level.⁷⁷ In the first half of 1956, imports of all commodities rose above the 1937 volume; total exports, however, remained below the 1937 level. Raw silk exports in the first quarter of 1955 were only 14% and cotton fabric exports 36% of their 1937 levels.⁷⁸ Japanese industry suffers from the obsolete state of its equipment, the small size of industrial units, the high cost of power,⁷⁹ and a price structure which, despite the disinflationary policy adopted in the fall of 1953, is still out of line with that of other industrial countries.

Despite its problems, Japan has made remarkable progress in recovering from the effects of the war and the loss of markets and sources of supply in previously controlled territories. The year 1954 witnessed a 28% expansion in the value of exports, while import values declined slightly. In 1955 exports rose by a further 23% while imports increased by only 3%. From the middle of 1954 to the middle of 1956, official exchange reserves about doubled. Progress may be expected to continue, although the forecasting of the rate of such progress over a period as long as 25 years presents more than usual difficulties.

For a shorter period — the six years between fiscal 1954 and fiscal 1960 — the target in the "Integrated Economic Plan" envisages a 34% increase in G.N.P. Behind this is a 12% increase in the labour force, a 30% drop in unemployment and a 19% increase in productivity. Over the same period,

⁷⁵ The term "fiscal year" or "fiscal" is used to designate the 12 months beginning on April 1 of the year mentioned.

⁷⁶ Data from International Monetary Fund, *International Financial Statistics*, December 1956.

⁷⁷ Economic Planning Board, Japanese Government, *Economic Survey of Japan (1954-1955)*, Tokyo, September 1955, p. 201.

⁷⁸ International Monetary Fund, *International Financial Statistics*, February and December 1956.

⁷⁹ The production of electricity, however, has risen rapidly. In 1955 it was 95% above the 1938 level, and, in the second quarter of 1956, 125% above 1938. Production of manufactured gas in 1955 was 113% above fiscal 1938 and it, too, has shown subsequent increases. (United Nations, *Monthly Bulletin of Statistics*, December 1955 and September 1956.)

industrial production would increase by 54%. The plan took account of the shifts required in industrial activity, noting that the development of light industry in underdeveloped countries was compelling Japan to devote more attention to heavy industry and to the chemical industry.⁸⁰ Japanese official views make clear that progress is to be based to a large extent on the expansion of exports, aided by rationalization and the disinflationary policy.⁸¹

Japanese *imports* amounted to 2.8% of the 1955 world total, excluding the Soviet bloc. This compared with 4.2% in 1937. Between the two years, Japan had fallen from fifth to ninth place among the world's importers. In fiscal 1954, imports, on a c.i.f. basis, amounted to 11% of G.N.P., as compared with about 17% in 1937. The United States and Canada supplied 36% of 1955 imports, with Latin America adding another 10% (both figures lower than in the previous year). The sterling area, largely the outer sterling area, contributed 24%, while Continental O.E.E.C. countries provided 5%. In comparison with 1937, the major changes have been a decline in the shares of imports coming from the sterling area and Western Europe and a rise in the share from Latin America and the rest of the world.⁸² In part, these shifts may be explained by the relative availability of dollars, difficulties which have existed in sterling trade and payments, and the willingness of certain partner countries to conclude trade and payments agreements.

Postwar Japanese *financial and commercial policy* has had its basis in a situation of foreign exchange stringency and a precarious balance of payments in which imports and transportation costs greatly exceeded export proceeds, so that balance could be achieved only through large Governmental receipts, including those from the purchase of goods by United States and U.N. forces. Thus Japan has maintained a complex and relatively severe system of exchange and trade restrictions, and has employed a number of devices in an effort to stimulate exports. An important part of Japanese trade has been carried out under bilateral trade and payments agreements, in some cases at prices above those prevailing on world markets. They have, however, been held to be necessary to expand balanced trade.

The 1955 balance of payments position was much more favourable, but exports were still below imports, and United States and U.N. military expenditures in Japan exceeded the rise in exchange reserves. Further, the payments position was aided by a large agricultural output which reduced import needs and by purchases of United States surplus agricultural products against payment in yen. The improved situation, however, enabled the government to increase the foreign exchange budget for April to September,

⁸⁰ "A Gist of Integrated Economic Plan, drafted by the Economic Council and submitted to the Government for its consideration", November 5, 1955.

⁸¹ See, for example, Economic Planning Board, Japanese Government, *op. cit.*, pp. 1-22.

⁸² International Monetary Fund, *International Financial Statistics*, December 1956.

1956, by 37% over the same months of 1955. Despite the liberalization of imports, the restrictive system remained, although discrimination against dollar imports was relaxed somewhat and further dollar liberalization was expected.⁸³ At the same time, the role of barter trade has been reduced, although not eliminated, and open account bilateral agreements with several countries have been replaced by cash settlement agreements in convertible and transferable currencies.

While relatively severe, the Japanese restrictive system has been less discriminatory against dollar imports than might have been expected in the light of the fact that exports were more concentrated on soft currency markets than imports. Export promotion schemes and bilateral agreements may have resulted in favourable treatment for certain soft currency imports. Yet in 1954, the United States, Canada and the dollar countries of Latin America supplied 46% of Japanese imports while taking only 23% of her exports.⁸⁴ In 1955 exports to the United States and Canada rose rapidly and, while exports also increased more rapidly than on average to sterling area countries and continental Europe, there was a decline in shipments to the rest of the world. Meanwhile, imports from the sterling area rose both absolutely and as a percentage of total imports, largely as a result of changes in import licensing practices. The share of imports coming from other countries outside the Western Hemisphere also increased, but more moderately. Better bilateral balance was achieved — a significant development in view of the past accumulation of claims under payments agreements. In 1955, however, imports from the dollar area still exceeded exports, the percentages of total imports and exports being 41 and 28, respectively.⁸⁵ In considerable measure, of course, the relative mildness of discrimination has been made possible by the high proportion of receipts on governmental account which have been in dollars.

On the other hand, Japanese exports, while still below prewar levels, have been subjected to discrimination in a number of markets through tariff or licensing policies — discrimination which could not be justified on hardness-of-currency grounds. In large measure, it was based upon political grounds and upon a widespread fear of a return of Japanese competition of the type which existed in the 1930's. Japan has sought to assure the world that fair trading policies will be followed, and has, for example, limited the export of cotton goods to the United States and Canada, countries which have granted most-favoured-nation treatment to Japan. Discrimination against imports from Japan in the world's markets has been reduced, but the problem has not been eliminated.

⁸³ International Monetary Fund, *International Financial News Survey*, April 20, 1956, p. 331.

⁸⁴ Statistical Office of the United Nations, International Monetary Fund, and International Bank for Reconstruction and Development, *Direction of International Trade*, Annual Issue — Annual Data for the years 1938, 1948 and 1952-55, p. 250.

⁸⁵ *Ibid.*

The six-year economic plan envisaged that the current account of the balance of payments would reach equilibrium with no special receipts by fiscal 1960. This, however, would appear to imply only a very modest increase in the 1954 ratio of imports to G.N.P.⁸⁶ The magnitude of the task of achieving long-run balance between imports and exports, at a high enough level to provide adequate imports to meet the needs of a growing economy and adequate exports to support employment, should not be underestimated.

Of the world's major trading nations, Japan perhaps stands to lose most as a result of the formation of a European customs union and free trade area. Dependent upon exports of manufactures, she would face initially increased competition within the protected European area. In 1955, Japanese sales to the United Kingdom and Continental O.E.E.C. countries made up 9% of total exports.⁸⁷ While not a large share, it is significant. Of possibly much greater importance might be the competition in Asian and Latin American markets which would result if the European arrangements ultimately resulted in substantially increased European efficiency. Such developments could make more difficult the Japanese achievement of a high level of balanced trade.

The underlying balance of payments problems of Japan suggest that it would be unlikely that the establishment of the convertibility of major European currencies would by itself bring significant liberalization of Japanese restrictions. The multilateralization of payments would tend to ease one Japanese problem arising from the fact that hard currency countries have tended to be more important as sources of imports than as destinations for exports. On the other hand, concern has been expressed in Japan that a convertibility move might mean intensified competition in third markets.

The long-term future of Japan as an import market is dependent upon the country's ability to recover its export position. As has been indicated, the basic task is that of rationalization, made all the more difficult by the displacement of silk by artificial fibres and by the increasing domestic production of cotton textiles in former markets. The task is difficult, but the characteristics of the Japanese people suggest that it will be successfully accomplished and that Japan will continue as a major importer on a basis less and less dependent upon extraordinary receipts.⁸⁸ A question of importance to Canada concerns the extent to which recent dependence upon imported wheat and barley is likely to continue. Some sources have suggested that the shift to wheat will continue and that Japan, 30 years from now, will be the world's largest importer of wheat.⁸⁹ Thus it has been suggested

⁸⁶ "A Gist of Integrated Economic Plan . . .", cited earlier.

⁸⁷ International Monetary Fund, *International Financial Statistics*, December 1956.

⁸⁸ The *Survey of Current Business* study on U.S. imports and domestic business noted that, after losing much of its large prewar silk market in the United States, Japan had become successful in marketing new types of production in that country. Included were plywood, steel and sewing machines. By the first half of 1955, U.S. imports from Japan other than silk reached an annual rate of nearly \$350 million, nearly five times the average rate in 1948-49 and over three and one-half times the rate in 1937. (Bradshaw, Roxon and Lechter, *op. cit.*)

⁸⁹ *The Financial Post*, Toronto, June 9, 1956.

that Japan could become as large a market for Canadian grain products as the United Kingdom has been in the past.⁹⁰ On the other hand, the record rice crop of 1955 enabled a reduction of food imports, suggesting that domestic or soft currency rice may continue to be preferred to hard currency wheat. Yet, even if wheat imports show little growth, a great increase in the Japanese market for other basic materials would seem to be likely.

(f) *U.S.S.R., Eastern Europe, and Mainland China*

Canada's exports to the countries which now constitute what is here called the Soviet bloc⁹¹ have at various times been of some importance. In the period 1926-28, these countries took about 1.6% of Canadian domestic exports to all countries other than Newfoundland. In 1929, the figure was 2.8%, but it declined during the 1930's. Immediately after the war, in 1946, these exports rose to \$95 million or 4.1% of the total. By 1951, the figure had declined to insignificance, but, in the first half of 1956, sales of wheat raised it to almost 2% of total exports. From 1926 until 1949, when the present regime assumed control on the mainland, China was much the most important market within this group in most peacetime years. The U.S.S.R., Poland and Czechoslovakia have also been of importance, particularly in the immediate postwar years and in the first half of 1956.

Rates of growth of population and G.N.P. in the Soviet bloc are of relatively little significance in any assessment of the role which these countries may play in future international trade. Of overwhelming importance is the political climate which will govern relations between them and the rest of the world, and different assumptions about this could lead to any number of vastly different results. Thus no attempt is made here to set out or appraise the population and G.N.P. data which are available.⁹²

From time to time, as in the period between the two Geneva Conferences held in 1955, there has been discussion of the possibilities of increasing trade between the Western World and the countries of the Soviet bloc. It has been suggested that this would provide the West with important sources of minerals and forest products and mean intensified competition for its producers of these commodities, but that it would also provide vast markets for some of its exports, including markets for surplus agricultural commodities. No attempt is made here to assess the likelihood of improved commercial relations between East and West, the basis of which is political rather than economic. Some consideration may, however, be given to the possible scope of trade under such circumstances.

⁹⁰ *The Gazette*, Montreal, September 20, 1956.

⁹¹ See footnote 1.

⁹² For an appraisal and forecast for the U.S.S.R. and Eastern Europe see *Trends in Economic Growth: A Comparison of the Western Powers and the Soviet Bloc*, cited earlier. Recent industrial developments in this area were considered on pp. 25-40 of United Nations, Economic Commission for Europe, *Economic Bulletin for Europe*, Geneva, August 1956. This same source, on pp. 43-85, contained an article on East-West European trade.

Past experience suggests that, while trade between the Soviet bloc and the rest of the world could be greatly expanded, there may be fairly low limits unless conditions differ considerably from what they were in the prewar periods. In 1938, the chief outside countries in trade with what is now the Soviet bloc sent to that area about 6% of their total exports and received from it about 6.5% of their imports.⁹³ In 1954 these same Western countries sold only 2.1% of their exports to the Soviet bloc and bought 2.2% of their imports from that area. For the United States and Canada, and for Latin America, the figures averaged well below 1%. For Finland, on the other hand, they were about 28%.

Between 1954 and 1955 there occurred a considerable increase in trade between the Soviet bloc and the rest of the world, largely within the framework of bilateral agreements. Although strategic controls were eased in the West, total imports by the rest of the world grew more rapidly than total exports to the Soviet bloc. Despite the growth in trade, for the chief trading countries referred to in the previous paragraph, the proportion of exports going to the Soviet bloc rose only to 2.2% and the share of imports from that area went up only to 2.6%. The differential movement, however, resulted in the emergence of a substantial deficit with the Soviet bloc.

Although East-West trade could presumably become of significance in some commodities and to a growing number of countries, the foregoing suggests that if it is to make a great over-all contribution to the trade of the West, more than a mere return to prewar relationships would be required. The data examined indicate that an increase in total East-West trade to some two and one-half times its 1955 relation to the over-all trade of the West would be required to restore the prewar relationship. The staff of the U.N. Economic Commission for Europe (E.C.E.) has calculated that, although East-West European trade reached its postwar peak in 1955, Western European exports were still only two-thirds of their prewar volume and Eastern European exports did not attain half of the prewar level. The growth in East-West European trade was continuing, however, in 1956. Further, it was expected that the trade agreements concluded between the U.S.S.R. and a large number of overseas countries would begin to result in increased trade during 1956.⁹⁴

Considerable uncertainty exists about the export or import potentials of the Soviet bloc, particularly of the U.S.S.R. around which has centred much of the discussion of trade possibilities. Needed metals are or can be produced in large quantities, but local requirements are high and it is difficult to know

⁹³ These percentages, and those for 1954 and 1955 which are given below, cover the trade of the United States, Canada, Latin America, the sterling area, Continental O.E.E.C. countries and their dependencies, Egypt, Finland, Indonesia, Iran (imports only), Japan and Yugoslavia. The source is Statistical Office of the United Nations, International Monetary Fund and International Bank for Reconstruction and Development, *op. cit.* Prewar data include the trade of the whole of Germany and postwar data exclude trade between Eastern Germany and the Federal Republic.

⁹⁴ United Nations, Economic Commission for Europe, *op. cit.*, pp. 43 and 45. In this source, Western European statistics cover the O.E.E.C. countries (except Ireland and Portugal) plus Finland and Yugoslavia.

if these could be met and still leave significant amounts available for export. The E.C.E. data show 1955 Eastern European exports of silver and platinum at under 3% of the total exports to Western Europe, and exports of other crude minerals (not including coal, petroleum or fertilizers) at about the same level, or less than Western European exports of non-ferrous metals to Eastern Europe. In each case, roughly two-thirds of the Eastern European exports came from the U.S.S.R. Iron and steel accounted for under 5% of the total and, while refined non-ferrous (non-precious) metals were not shown separately in the data, the item for all other commodities was only 6.5% of the total exports and of this only 1% came from the U.S.S.R.⁹⁵

Possible Soviet supplies of forest products were examined in a study by the Forest Service of the United States Department of Agriculture appearing in the Paley Report. That study anticipated that in the 1970's there would be a substantial free world deficit in industrial wood (all primary wood products except fuelwood and wood for charcoal and distillation). The free flow of world trade would change the outlook. But even under the most favourable world conditions, the volume of wood exports from the U.S.S.R. would not be expected to exceed some 50 million cubic metres (roundwood). Although this would be nearly five times the prewar peak, it would be barely one-quarter of the average free world deficit of 194 million cubic metres anticipated for 1970-79. Other countries in the Soviet bloc would not be in a position to export more than minor quantities.⁹⁶ The E.C.E. study showed wood and wood products, two-thirds from the U.S.S.R., as accounting for 16% of 1955 exports from Eastern to Western Europe. The Soviet Union had been rebuilding its position as a major exporter, but even the large export volume reached in 1955 was modest by comparison with the prewar level. While Soviet exports were appreciably below those of Sweden, Austria and Finland, however, Western European timber imports from North America fell in 1955 to less than those from Eastern European countries.⁹⁷ Nevertheless, future world timber requirements are expected to be so great that it is difficult to see how more normal trading relations with the U.S.S.R. could substantially affect Canadian prospects in 1980.⁹⁸

Other Eastern European exports to Western Europe in 1955 included cereals and other foods, coal and coke, petroleum and products, vegetable fibres, fertilizers and cement. In much of this trade, notably in grains, coal and petroleum, Eastern European requirements would seem to make unlikely

⁹⁵ *Ibid.*, pp. 73 and 81.

⁹⁶ *Paley Report*, Vol. V, p. 60. See also Part B, Section 8, of this study.

⁹⁷ United Nations, Economic Commission for Europe, *op. cit.*, pp. 52 and 73.

⁹⁸ It may, however, be noted that it has been reported that Scandinavian timber producers have been concerned about increasing competition from the U.S.S.R. Total production of timber in the U.S.S.R. in 1954 was about 80% above the prewar average, but exports, although they had increased, were only 2.5% of production as compared with 20% before the war. Scandinavian producers were of the opinion that exports might be increased considerably beyond the current 2.5% of total production, especially if the U.S.S.R. Government should find it possible to cut domestic consumption in favour of exports. (International Monetary Fund, *International Financial News Survey*, Washington, D.C., September 2, 1955 — based upon *Norges Handels og Sjøfartstidende*, Oslo, Norway, August 11, 1955.)

a rise in the share of Western European requirements supplied by the East, at least in the near-term future. Eastern European exports of various manufactures to Western Europe (including iron and steel) increased by about 40% between 1954 and 1955. But, according to the E.C.E. staff, exports of engineering products have met difficulties, arising in part from inadequate past progress in adapting design and finish to Western requirements. The overcoming of this problem appeared to have been receiving study. Although there were complaints that Eastern textiles were priced very low, there were also indications that there was growing concern in the East about the profitability of exports which had to be sold at low prices in the most competitive markets. There seemed to be an attempt in Eastern Germany to concentrate such exports — especially textiles — on those countries where prices under bilateral agreements were relatively favourable. Indeed, the E.C.E. study concluded with the suggestion of a more rapid expansion of Eastern European trade with overseas countries than with Western European countries.⁹⁹

Leaving aside non-economic considerations for the moment, there may well be fairly low limits to the expansion of exports by the Soviet bloc — although it is difficult to speak with precision or confidence. What about imports by the Soviet bloc? These could presumably substantially exceed exports if credits were granted or if they were paid for out of gold production, particularly that of the U.S.S.R. In discussion of the possibility of increased trade, some attention has been paid in the United States press to the possibility of the disposal of agricultural surpluses. While Canada has exported substantial quantities of wheat to the U.S.S.R., Poland and Czechoslovakia, it is impossible to know whether or not such demands will persist. Unless they last for many years, however, it seems unlikely that they could induce purchases which would significantly reduce North American agricultural surpluses. When trade was at higher relative levels in the past, Soviet purchasing in North America concentrated on industrial and agricultural machinery and similar commodities. In 1938, for example, United States exports to the U.S.S.R. totalled U.S.\$ 70 million, of which \$58 million was in the form of finished manufactures of non-agricultural origin, and almost all of the remainder was non-agricultural semi-manufactures.¹⁰⁰ If trade should flow more freely in the future, it seems likely that these commodities, rather than agricultural items in surplus, would be in greatest demand.

The possibility of a further substantial increase in East-West trade was raised by the proposals to the U.K. Government by the Soviet leaders during their visit to London in April 1956. Interest was expressed in imports of roughly \$500 million a year from 1956 to 1960, largely machinery and

⁹⁹ United Nations, Economic Commission for Europe, *op. cit.*, pp. 50 ff.

¹⁰⁰ U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, *Foreign Commerce and Navigation of the United States, Calendar Year 1938*, U.S. Government Printing Office, Washington, D.C., p. xvii.

other industrial and transport equipment of which about a third was still subject to strategic controls. The proposals would seem to imply a fivefold or sixfold increase in U.K. exports to the U.S.S.R. and, assuming a corresponding rise in exports to the United Kingdom, something more than a threefold increase in Soviet deliveries as compared with 1955 levels. This would still not represent more than 5% or 6% of U.K. trade; but many of the goods desired by the U.S.S.R., as well as many of the goods which it has exported to the United Kingdom in the past, have been in short supply in relation to domestic and export demands.¹⁰¹

For the immediate future, it would appear that there could well be some increase in East-West trade. Export restrictions have been eased further and there have been reports of increased Soviet orders and interest in Western exports. Further, it has been reported that the United Kingdom has decided to allow increased exports to mainland China.¹⁰² New trade agreements have been signed and larger quotas and a diversification of trade has been indicated by renewals. A few countries, such as Egypt, Finland, Iceland, Iran and Turkey, already conduct a significant proportion of their trade with the Soviet bloc.

For the longer term, it would appear that the continuation of present tension would mean that East-West trade will remain relatively unimportant in the broad movements taking place in the Western world. A freeing of the channels of East-West trade would be important in some spheres, but it would not appear to alter substantially the general conclusions reached on the assumption of a continuation of present tension. The chief qualification to this probably relates to the possibility that an attendant reduction in armament expenditures might bring problems of maintaining employment at tolerable levels; unless offset, this could have effects on world trade.¹⁰³

The main purpose of the foregoing paragraphs has been to consider the possibilities which might flow from an easing of trade barriers between East and West attendant upon a decrease in tension. It has been assumed that, in such circumstances, trade would be governed by economic forces and that domestic demands would be allowed to affect export availabilities. Assuming now that the East-West political struggle continues, a relatively new development requiring consideration is what has been called the Soviet offensive in the field of trade and economic assistance.

The increased trade and assistance activity of the Soviet bloc appears to be directed primarily at the underdeveloped countries, although there have also been a number of efforts to establish closer contacts with Western Europe and North America. On the trade side, the U.S.S.R., Eastern

¹⁰¹ United Nations, Economic Commission for Europe, *op. cit.*, p. 60.

¹⁰² *The Gazette*, Montreal, May 18 and June 5, 1956.

¹⁰³ See Section II (a).

Europe and mainland China have made substantial purchases of commodities which the exporting country was finding difficult to sell in Western markets. Notable examples have been the purchases of Burmese rice, Ceylonese rubber, Cuban sugar, Egyptian cotton, Icelandic fish, and Iranian rice and other agricultural commodities. It has been suggested that imports may be in excess of the requirements of the purchasing country — that much of the U.S.S.R.'s imports of Burmese rice went to Vietnam, that China's purchases were rerouted to Ceylon in exchange for rubber, and that Hungary also sought to sell Burmese rice to Ceylon at less than market price.¹⁰⁴

The Soviet countries are increasingly active in offering steel, machinery and other manufactures in exchange for these goods. Trade is promoted through participation in trade fairs, official visits and the supplying of technical assistance. Specifications, prices and delivery terms appear to be competitive and gains are made by the ability to offer package deals covering all the material requirements of a development project, together with technical assistance. In addition to some outright gifts, substantial credits at low interest rates have been offered to such countries as Afghanistan, Egypt, India and Yugoslavia.

To date, both trade and assistance from the Soviet bloc have been small in comparison with that coming from the West. Nevertheless, Soviet activity is increasing and impressive strides have been made in such countries as India. As cost considerations or home requirements need not be dominant, it is quite impossible to predict its future. The Soviet bloc, however, appears to have the capacity to absorb large exports from the underdeveloped countries and to supply substantial quantities of goods and "know-how" desired for industrial development. This could directly affect North American trade. To the extent that it enabled underdeveloped countries to reduce purchases from Western Europe, it could mean a reduction in European buying power, although it might at the same time force Europe to rely more heavily on such sources as Canada for its basic materials. The latter could be offset if the activity were broadened to involve the export of Soviet materials to Europe. The political basis of the operation makes it unpredictable. Its very unpredictability, however, and the possibility of its sudden appearance or withdrawal at various points could make it all the more disruptive to the orderly development of world trade.

The future may see changes in the relations of the industrialized countries of the West to the underdeveloped countries. It is possible that the volume of aid to the underdeveloped countries might be increased and that new techniques might remove some of the features of bilateral assistance which underdeveloped countries have found difficult to accept in the past. The NATO reappraisal or efforts through the United Nations might produce such results. If aid on an acceptable basis were increased, it would mean

¹⁰⁴ London Observer Service, in *The Globe and Mail*, Toronto, July 10, 1956.

that economic development could proceed more rapidly and that exporting countries, including Canada, could gain both from the ultimate increase in the buying power of the underdeveloped countries and through helping to supply the needs of their development programmes.

(g) *Other Countries*

While Canada's exports show a considerable measure of concentration, over 8% of the 1955 total went to the numerous countries and dependent territories which have not yet been considered, most of which may be classed as underdeveloped. Exports to these areas in 1955 were of about the same relative importance as in 1928 and 1937. Although it does not show clearly in the table at the beginning of this section, there has been some decrease since prewar in the importance of sterling area markets and some relative increase in Latin American and all other sales. The most important of these export markets in 1955 were Mexico at 0.9% of total exports, the British West Indies at 0.8%, Venezuela at 0.7%, India at 0.6% and Colombia at 0.5%. In previous years, exports to Brazil had also been of importance.

The *population* of the countries considered in this group is large and is expected to increase fairly rapidly. The United Nations has estimated that, in 1950, these areas contained 1.1 billion people or about 45% of the world's total population (including in the world's total China, the U.S.S.R. and Eastern Europe). Of these 1.1 billion people, almost a third were to be found in India. India, Pakistan and Indonesia accounted for 46% and, if Brazil were added, the total would be raised to about 51%. Most of the countries in the group are in areas characterized by high birth rates, although differing mortality rates obtain in different areas. The U.N. forecasts, based upon these characteristics, suggested that, between 1950 and 1955, the population of these countries as a group would rise by 7% and, between 1955 and 1980, by 50%. In 1980 they would contain, on the basis of these forecasts, some 1.8 billion inhabitants or about 49% of the world's total population.¹⁰⁵

There are difficulties in forecasting Gross National Product changes for the group of countries here under consideration. While national income data are available for many of them, the basic source material in a number of cases is far from adequate, partly because of the difficulties associated with income measurement in self-contained subsistence economies. Future growth is to be expected and development programmes envisage rapid change. Yet the pace and character of the growth is subject to many uncertainties. Generally, however, these countries are largely raw material producing. With some exceptions, their levels of consumption are low and they have relatively little industrial capacity. Their basic aim is to

¹⁰⁵ United Nations Population Division. "Framework for Future Population Estimates, 1950-1980, by World Regions". See footnote 45.

raise levels of consumption. Plans to achieve this encompass increasing the efficiency of agricultural production and, especially, the expansion of industry.

The Paley Report, after noting the difficulties of measuring output in these countries, suggested that, even if it were possible to quantify the expected increases in G.N.P., it would not be possible to tell, within even very wide margins of error, what materials drains (the problem concerning the Paley Commission) would be associated with the increases. If improvements in agriculture permitted the population to live at a standard twice as high as before, no additional drain on exhaustible resources might ensue. But if there were an addition in real income mainly to wealthier groups, or if certain types of investment programmes were undertaken, the requirements for materials might increase substantially. Thus it was decided to estimate the materials consumption of the less developed areas more directly though arbitrarily. Requirements were expected to increase greatly between 1950 and 1975 but quantitative assessment of such growth had to be rough. Accordingly, materials demand in these areas was projected to grow at more than three times the United States rate, with the precise rates applied held not to be significant in themselves.¹⁰⁶

The *imports* of this group of countries bulk large in world trade. In 1955 they took 29% of the total of world imports outside of the Soviet bloc, or nearly as much as did continental Western Europe. Sterling area countries in the group accounted for more than 9% of the 29%. The sources of these imports varied greatly among the different countries and regions. The outer sterling area (including Australia, New Zealand and South Africa) obtained 35% of their 1954 imports from the United Kingdom and 19% from other territories within the area. Continental O.E.E.C. countries supplied 15% and the United States and Canada only 12%. Latin America, on the other hand, acquired 49% of its 1955 imports from the United States and Canada, 12% from within the area, 23% from Continental O.E.E.C. countries and only 7% from the sterling area (mostly from the United Kingdom). The dependencies of Continental O.E.E.C. countries in 1955 relied on these Continental countries for 56% of their imports. Other members of the group supplied 6%, the sterling area 7%, Latin America 18% and the United States and Canada 8%. For the remaining countries considered in this subsection, and Japan, the United States and Canada were the most important sources of imports, accounting for 28% of the 1955 total. Latin America supplied 5%, Continental O.E.E.C. countries 23% and the sterling area 21%.¹⁰⁷

The significance of European regional arrangements and of sterling convertibility for the *commercial and financial policies* of certain members

¹⁰⁶ *Paley Report*, Vol. II, p. 132, in chapter prepared by Arnold C. Harberger. The coverage differs somewhat from that employed in this study, excluding Finland, Spain and Yugoslavia and including Turkey and the Union of South Africa.

¹⁰⁷ International Monetary Fund, *International Financial Statistics*, April and December, 1956.

of the sterling area was considered in an earlier subsection. It was suggested that European regionalism might damage export prospects, at least in the short run, and that convertibility need not bring major changes in the sterling area arrangements, although it would increase pressures to eliminate restrictions and particularly discrimination.¹⁰⁸ Much the same might be said regarding the effects of such moves on the United Kingdom's dependent territories and other members of the outer sterling area, although, under convertibility, the responses to the pressures to liberalize would vary and might be lessened by the effects of development programmes.¹⁰⁹ Somewhat the same would apply, *mutatis mutandis*, to the overseas dependencies and members of the monetary areas of continental Western European countries. While the extent of exchange control within monetary areas varies, a usual feature has been that most payments agreements relate to settlements between the monetary area as a whole and the other country concerned. Thus the effects of convertibility on the non-metropolitan areas would in some degree be dependent upon the role, if any, which Western European countries assigned to their payments agreements under convertibility.¹¹⁰ The degree of attachment of these areas to European regional arrangements would, of course, be relevant both to them and to their competitors.

The future of payments and trade agreements will also be of significance to other countries considered in this subsection, *i.e.*, those which are not members of monetary areas centering in Europe. Some of these countries may already be considered as having convertible currencies,¹¹¹ although in some cases they have made some use of restrictions, bilateralism or multiple currency practices. Others, however, continue to meet balance of payments problems through the use of restrictions, and conduct significant proportions of their trade under bilateral agreements. As noted, the significance of bilateralism has been decreasing. Even with convertibility in Europe, however, the countries considered here would probably wish to retain bilateral agreements among themselves and with members of the Soviet bloc. There would also likely be pressure to maintain the credit and trade facilities provided by agreements with industrialized countries. As has been noted, some European countries might themselves be anxious to maintain agreements even after their currencies became convertible. At the same time, however, the opening of commodity markets and the relaxation of restrictions and discrimination in Western Europe have already meant that the benefits to raw material producers which are possible from a policy of bilateralism have been reduced. Convertibility would tend to mean a further reduction.

¹⁰⁸ See Subsection (d) of this section.

¹⁰⁹ The matter of future relations between the outer sterling area and the United Kingdom was considered briefly in Subsection (b).

¹¹⁰ See Subsection (c).

¹¹¹ Cuba, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Liberia, Mexico, Panama, Saudi Arabia, and Venezuela (International Monetary Fund, *Seventh Annual Report on Exchange Restrictions*, Washington, D.C., 1956, pp. 319 and ff., 353, and 362-363).

Of overriding importance to the commercial and financial policies of most of the countries here considered is the pressure for economic development. The basic goal is the increase of very low standards of living, frequently accompanied by the desire to escape from the role of raw material suppliers for the industrialized powers and the hope that, through development, it will be possible to escape from the effects of violent fluctuations in the prices of and demand for primary commodities upon which their economies now depend. Programmes for economic development are adopted to force the pace, sometimes beyond the absorptive capacity of the economy and sometimes in fields which might better await more basic developments but which may appear to yield impressive results. This is not to be taken as a criticism of the basic aim of economic development, nor of the aims of development programmes which are soundly conceived and executed. Further, programmes are not to be condemned because of difficulties which inevitably arise in such large-scale undertakings. It is, however, to be stressed that, in the absence of a major catastrophe, economic development will be pursued with religious fervour at least over the next quarter century. Other economic policies of many underdeveloped countries will be subordinated to development.

The needs are so great in relation to the resources at the command of the underdeveloped countries that it is quite impossible to predict how much will have been achieved in 25 years. Notable progress should be possible in some areas, but many of the countries which regard themselves as underdeveloped today will probably feel that they are still underdeveloped in 1980. Progress may well be less rapid than they had wished and much will remain to be done.

To the extent that external assistance is available for soundly conceived developmental projects, and is acceptable on terms which will not cause potential sources to dry up, the pace of development can be faster or the inflation and restrictions which often tend to accompany it can be reduced. The preceding section has suggested the possibility of expanded programmes of economic aid and technical assistance both from the Soviet bloc and from the industrialized countries of the West. In the past, most of the assistance has been bilateral in character and this may continue. The extent to which private loans could be fitted into developmental programmes depends on many factors, including local and international political conditions. Multi-national or international assistance programmes may, however, become relatively more important. The Colombo Plan, the U.N. technical assistance programme, the International Monetary Fund and the International Bank for Reconstruction and Development provide technical aid (in all cases) and funds for development projects or to assist in overcoming balance of payments difficulties which may accompany development. In 1956 the International Finance Corporation, an affiliate of the International Bank, was created to invest in productive undertakings

in association with private capital, and without the government guarantees required by the Bank. Another possibility is the establishment of the Special United Nations Fund for Economic Development (SUNFED) which has for some time been under U.N. discussion. In some form or other, the continuation and probably the increase of external assistance to economic development is to be expected.

Some countries — notably India until fairly recently — have demonstrated their ability to pursue economic development without inflation, and some are able to proceed without significant restrictions other than tariffs. Frequently, however, development programmes mean that resources are bid away from other lines of activity and that large imports fitting in with the programme are needed. The former creates inflation; the latter brings balance of payments problems unless offset by capital imports. Where inflation exists, the balance of payments problem is intensified — both because of the demands created for imported goods of all types and the worsened competitive position of domestically produced goods for home consumption and for export. The fiscal and monetary systems being also frequently underdeveloped, balance of payments difficulties are generally met by import and exchange restrictions, subsidies and other export incentives, and sometimes by progressive depreciation of the currency. Increased external aid could mean that development could proceed without inflation and balance of payments difficulties. It is unlikely, however, that the pace of economic development will be restricted to the limits implied by such aid, and a continuation of policies involving some restrictions and subsidies over the next 25 years seems likely in much of the underdeveloped world.

Considerable importance attaches to questions concerning the extent to which underdeveloped countries will continue to be sources of supply for agricultural and other basic materials. In considerable measure, the developed countries rely on these areas for vital material supplies. In some commodities, these supplies compete in export markets with goods from other countries, and Canada's export prospects are dependent upon the terms upon which competing supplies are available. Further, beyond what is available through external loans and grants, the ability of the underdeveloped countries to import — and the pace of their development — depends upon their ability to export basic materials.

Development programmes encompass improvements in the production of foods and basic materials. It is admittedly quite possible that this will, at least initially, reduce demands for such commodities as Canadian wheat, but its over-all effects on world trade will probably not be great. In so far as export commodities of the underdeveloped countries are involved, certain limits to their increased output are frequently to be found. The production of many plantation-type commodities requires a large

input of labour and the possibilities of mechanization seem to be far from universal. Despite large populations, the supply of labour with the skills required is limited and difficult to increase in the face of other needs. Facilities for processing crops grown on plantations, for concentrating ores, etc., may require heavy capital investments and thus must compete with other demands for capital. The type of economic development with the greatest appeal is industrialization, and the demands for the setting up of both light and heavy industry reduce the resources available for basic export industries and reduce the attention paid to them. In some cases, the development programme itself creates local demands for goods which might otherwise be exported. Where inflationary conditions exist, ability to export may be reduced.

In these circumstances, it seems unlikely that the process of economic development will mean great increases in the foods and basic materials available from the underdeveloped countries. Some increases will undoubtedly occur; but there may also be decreases. On balance it seems likely that there will be some growth but that it may well be less rapid than the general expansion of world production and trade.¹¹²

As the demands for imports arising from development programmes and from the general expansion of incomes in underdeveloped countries may well grow more rapidly than their exports, the continuation of measures to restrict imports and perhaps to encourage exports is likely. These will probably include import and exchange quotas and multiple currency practices. Undoubtedly, imports to meet basic consumer needs and those necessary for the development programme will be treated most liberally. Most severely restricted will be goods held to be non-essentials and those which can be produced locally. Special attention will be given to the protection of the products of developing local industries. The demand for imports will undoubtedly continue large, with heavy purchasing of machinery, equipment and certain basic materials; but balance of payments difficulties and protectionism will tend to mean severe restrictions on "luxuries", light manufactures and processed goods where the processing can be done

¹¹² Between 1937 and 1955, the volume of exports of underdeveloped countries with few exceptions, such as in the oil-rich sterling area countries of the Middle East, either declined or showed smaller increases than did the volume exported by developed countries. This is indicated by comparing the following percentage changes (1937 to 1955) in the U.N. export quantum index.

Latin America.....	+4%
Middle East independent sterling area.....	+727%
Far East independent sterling area.....	-8%
Rest of non-European sterling area.....	+54%
Overseas terr. of cont. West. Europe (a).....	+43%
Middle East non-sterling.....	+46%
Other Far East.....	-38%
United States and Canada.....	+127%
United Kingdom, Iceland, Ireland.....	+68%
Continental Western Europe.....	+86%
World (excluding Soviet bloc).....	+55%

(a) Includes Morocco and Tunisia.

SOURCE: Quantum index based on 1953 = 100 in United Nations, *Monthly Bulletin of Statistics*, August 1956.

locally. As development progresses, heavy domestic industry will also receive more and more protection. The nature of import programmes, however, could be greatly influenced by the scale and nature of the external aid which is received.

IV. Conclusion

An examination of possible developments in the world trading environment over the period to 1980 does not suggest fundamental changes from the present situation.¹¹³ If there is no major war and if tolerable levels of employment can be maintained without the necessity of large-scale governmental efforts directed to that end, there should be a further relaxation of restrictions which hamper world trade. Potential relaxations in some areas may be delayed by the development of regional arrangements, the ultimate effects of which upon exchange and trade restrictions against outside countries will depend on their success in achieving the goals envisaged for them. Generally, protectionism, balance of payments difficulties and the fear of such difficulties will limit the extent of liberalization, but world trade will undoubtedly grow as incomes grow in the major trading nations.

The fact that the disappearance of every restriction other than moderate tariffs is not envisaged should not be allowed to obscure the substantial progress made in the postwar period. Nor should it detract from the further progress that can and may be expected to be made. International co-operation has been important in the postwar period, both in securing the relaxation of restrictions and in inhibiting the application of restrictions which might have been much more burdensome to international trade than were those which were actually in force. Such co-operation, and the international agencies through which it is effected, can continue to play constructive roles in the years ahead.

This chapter has not attempted a projection of the volume of world trade, but has rather been concerned with the general factors in the world trading environment which will affect Canada's exports. According to data published by the United Nations, world manufacturing production outside the Soviet bloc increased by 120% between 1938 and 1955. The volume of exports of manufactured goods rose at almost the same rate, namely 111%. Exports of all commodities rose less rapidly, by 64%, but, due to the more rapid increase in the prices of goods other than manufactures, the share of manufactures in the total value of trade was almost the same in 1955 as it had been in 1938.¹¹⁴ Indeed, a relatively constant share of manufactures in the value of world exports would appear to have persisted over a long period.¹¹⁵

¹¹³ On the high degree of stability in the present "system" and the possible disruptive forces, see Michael L. Hoffman, "The Present System of World Trade", *Lloyds Bank Review*, January 1956.

¹¹⁴ United Nations, *Monthly Bulletin of Statistics*, September 1956.

¹¹⁵ Data for 1881-1913, 1921-1938, and 1950, appearing in W. Arthur Lewis, "World Production, Prices and Trade, 1870-1960", *The Manchester School of Economic and Social Studies*, May 1952, pp. 106-107.

The vast changes which have occurred in political relationships and in the economic positions of countries suggest that a projection based on past trends in world production and trade could not be made with very much confidence. Further, Canada's exports will depend not upon the level of world trade in general but upon the demand for the goods which Canada produces and upon Canada's ability to supply those goods in competition with other suppliers. Trade in general and Canada's exports in particular are both determined within the same complex of forces, but the relation between them is far from direct. The level of production is expected to grow rapidly in the countries to which Canada exports. Indeed growth, supported by high levels of investment, is almost a corollary of the assumption or expectation of high levels of employment, given the manner in which many economies now function. With a substantial growth of production, it is anticipated that there will also be a substantial growth in world trade, although this presumably will not be at the same rate as the growth of production or at the same rate for all countries.

Within this general framework, forces making for protection of agricultural commodities seem likely to persist, so that export difficulties in this field may be expected to continue. Many manufactures and processed goods will continue in high demand, partly stimulated by the needs of economic development. Others, however, will more and more tend to be produced domestically and will be protected to encourage such production or to maintain balance of payments equilibrium. This need not, however, imply reduced importance for manufactured exports in world trade. With respect to basic mineral and forest materials, expanding economies will mean increasing needs which appear likely to continue to press against readily available supplies. As in the past, substitution and new discoveries will make developments uneven, but, over-all, the future looks bright in these commodities.

The strong demand for basic materials should hold up their prices relative to those of manufacturers. The 1930's saw the terms of trade move sharply against raw materials. Since that period, the opposite development has occurred. The weakness in agricultural markets suggests the possibility of a relative decline in prices of agricultural commodities, despite the artificial factors tending to keep up such prices. But the strength of the demand for other basic materials relative to anticipated supplies places them in a favourable position in comparison with manufactures where restrictions and competition are to be expected to continue to be more severe.

Since the war, the United States has become the world's largest import market, and has improved its position as the largest exporter. With full employment, the United States will undoubtedly experience greater absolute growth than any other country, and may well grow more rapidly than the world average. The growing needs of that economy for materials will mean strong demands for imports, despite the continuance of protectionist

pressures. Thus, while demands in other areas will continue to grow, the direct significance of the United States to world trade seems likely to increase over the next quarter century. Indirectly, a continued outflow of U.S. dollars is expected to continue to have significant effects upon the purchasing power of other countries.

CONCLUSIONS: EXPORTS IN 1980

THE OUTLOOK for exports, commodity by commodity, is considered in Part B of this study. In the present chapter it is necessary to draw together the elements of the forecast, to consider its reasonableness, to make certain adjustments, and to examine the implications of the result. Accordingly, the chapter deals first with the forecast which emerges from the commodity analysis in Part B, noting the commodity and area breakdown implied by that analysis. Next, some of the qualifications which pertain to the forecast are reviewed. In the third section, the way in which commodity exports may be expected to fit into the balance of payments is considered, and a moderate adjustment is made to the export forecast. Finally, the conclusions proper are presented — the expected magnitude of exports and their relation to G.N.P. in 1980, and the anticipated commodity and area breakdown of the export forecast.

I. The Forecast Which Emerges

(a) Total Magnitudes

Subject to qualifications which will be reviewed in Section II, the examination of the outlook for exports by commodity in Part B yields the following aggregate results.

Exports of Goods, 1954, 1955 and Projections for 1980
(millions of Canadian dollars)

	1954	1955	1980
Total domestic exports (excluding gold).....	3,881	4,282	10,375
New gold production available for export.....	155	155	125
Re-exports.....	66	69	175
Total.....	4,102	4,506	10,675

The projections for domestic merchandise exports, excluding gold, thus add up to a 1980 value of almost \$10.4 billion or 142% above the 1955 value. The projections for total exports of goods, including also new gold production available for export and re-exports, aggregate nearly \$10.7 billion or 137% above 1955.

The individual projections behind these aggregates assume a continuation of the 1955 over-all level of prices. In general, they are based upon 1955 prices for the commodities in question. In the cases of newsprint, wood pulp and aluminum, however, price changes have already occurred and it seemed more appropriate to value quantity projections at prices ruling in 1956. In a few cases, future price changes (relative to movements in the general price level) are anticipated and taken into account. Thus, lumber, certain other forest products and electricity are valued at prices above present levels, and uranium at a price below that now ruling. Nevertheless, the price factor in the over-all forecast is small. The introduction of anticipated price movements means that changes in the terms of trade from 1955 — a modest net improvement — are taken into account in so far as they emerge from this study.¹

(b) The Commodity and Area Breakdown of Exports

The projections emerging from the consideration of exports by commodity are summarized in Table 3. The coverage of the various categories is indicated in Part B, which gives the basis for the projections. Part B also provides part of the reasoning behind the area breakdown which is shown; more is given in the notes following the table. In many cases, the area breakdown presents even more difficulties than does the projection in total. In a sense, the figures are little more than illustrative, and it is not argued that they would obtain in detail even if export totals were in fact those which are suggested. Yet the figures are felt to represent reasonable possibilities and, in the aggregate, to provide an appropriate basis for considering the distribution of exports.

Comments on the pattern of exports suggested in the table are postponed until after a review of qualifications to the forecast and a consideration of certain adjustments to it.

¹ See Section IV (a) of this chapter.

Table 3

CANADA'S MERCHANDISE EXPORTS, 1955 AND PROJECTIONS FOR 1980

(millions of Canadian dollars)

	1955				1980			
	Total	U.S.	U.K.	Others	Total	U.S.	U.K.	Others
Wheat and wheat flour.....	413	12	167	234	450	15	180	255
Other agricultural and animal products.....	531	270	123	138	725	405	135	185
Lumber.....	385	273	70	41	600	465	105	30
Newsprint.....	666	578	33	55	1,250	900	130	220
Wood pulp.....	297	234	35	29	650	475	85	90
Other forest products.....	172	135	20	17	250	195	30	25
Petroleum and products.....	40	39	—	0	1,450	1,450	—	—
Other non-metallic minerals and products.....	166	110	19	38	525	430	35	60
Aluminum and products.....	213	84	99	29	1,000	525	350	125
Copper and products.....	175	82	53	40	300	185	65	50
Nickel.....	215	146	40	29	350	220	70	60
Uranium oxide.....	25	25	—	—	200	170	20	10
Other non-ferrous metals and products (excl. gold).....	203	124	56	23	475	325	95	55
Iron ore.....	100	80	9	11	500	390	35	75
Primary iron and steel (incl. scrap)....	92	48	19	25	200	110	30	60
Chemicals (excl. uranium).....	185	87	20	78	600	300	60	240
Sundry manufactures.....	353	199	5	149	700	370	10	320
Other domestic exports	51	33	3	15	150	115	5	30
Re-exports.....	69	53	5	12	175	140	10	25
Total (excl. gold).....	4,351	2,612	774	965	10,550	7,185	1,450	1,915

Notes on the Area Breakdown of Projections in Table 3

Wheat and Wheat Flour

About the same percentage distribution as in 1955 is assumed.

Other Agricultural and Animal Products

In coarse grains, sales of malting barley and feed oats to the U.S. are expected to mean that about 60% of exports go to that country. Barley exports to the U.K. are expected to fall from the high 1955 level and coarse grain exports to other countries to remain at about the 1955 value. Most of the growth in other agricultural and vegetable products is expected in inedible items where overseas markets have been dominant — about the 1955 percentage distribution is projected. The U.S. market is expected to remain dominant in exports of live animals and meats, and also in fish and fishery products where about the same percentage distribution as in 1955 is projected. Although little basis for projection or breakdown exists, a minor shift toward the U.S. is assumed in the case of other animal products.

Lumber

Distribution is in accordance with the lower estimate in the Commission's study on the forest industries. See Part B, Section 8.

Newsprint

Exports to the U.S. are approximately as suggested in the submission to the Commission by the Canadian Pulp and Paper Association (at prices ruling in the first half of 1956). For overseas countries, the Association forecast of \$469 million (similarly priced) has been written down to \$350 million, which has been allocated on the basis of 1955 exports.

Wood Pulp

Allocation is approximately as suggested in the Pulp and Paper Association submission (at January-June 1956 prices). See Part B, Section 10.

Other Forest Products

About the same percentage distribution as in 1955 is assumed.

Petroleum and Products

Although there may well be some exports to other areas, it is assumed here that the total goes to the U.S.

Other Non-metallic Minerals and Products

In asbestos and products, a moderate shift toward the U.S. market is assumed. Natural gas exports are expected to go entirely to the U.S. For the remaining items, about the 1955 distribution is assumed.

Aluminum and Products

A relative shift of exports from overseas countries to the U.S. is assumed. See Part B, Section 16.

Copper and Products

Exports to the U.S. are projected as growing about with anticipated U.S. imports, by 125%, and exports to the U.K. and other countries as increasing by 25%. See Part B, Section 17.

Nickel

The 1955 percentage going to the U.S. has been reduced somewhat. This may, however, still overstate the U.S. share when stockpile accumulation has ceased and Cuban production has increased.

Uranium Oxide

It is assumed that the bulk of Canadian exports will continue to go to the U.S.

Other Non-ferrous Metals and Products (Excluding Gold)

A small relative shift from the U.K. to the U.S. is assumed.

Iron Ore

The amount going to the U.S. has been determined with reference to anticipated U.S. demand. For the remainder, a more rapid increase is expected in sales to countries other than the U.K.

Primary Iron and Steel (Including Scrap)

Exports to the U.S. and to "other" countries have been assumed to increase more rapidly than those to the U.K.

Chemicals (Excluding Uranium)

Most fertilizer exports are expected to continue to go to the U.S. and sales to the U.K. to remain negligible. See Part B, Section 26, where a moderate increase in the U.S. percentage is implied. For synthetic rubber and other chemicals, about the same percentage distribution as in 1955 is assumed.

Sundry Manufactures

Some relative shift from the U.S. to overseas countries other than the U.K. is assumed. Particularly, the dominant 1955 U.S. shares for farm machinery and aircraft have been reduced somewhat. No change is assumed in the U.K. share for the group as a whole.

Other Domestic Exports

After allocating all projected exports of electrical energy to the U.S., about the same percentage share as in 1955 has been assumed for the remainder.

Re-exports

Re-exports to the U.K. and to other overseas countries in 1955 have been doubled and the balance of the increase allocated to the U.S. Thus, re-exports to the U.S. are shown as rising by 164%.

II. Qualifications to the Forecast

The projections arrived at in Part B have all been expressed in multiples of \$25 million. In Table 3 above, multiples of \$5 million have been employed in allocating these projections by area. The technique employed has been to suggest unique numbers rather than ranges; for one thing, the summation of ranges would provide serious difficulties. The absence of ranges, however, is not to be taken as implying confidence in the actual figures. In fact, they must be regarded as representing what are felt to be reasonable projections within ranges, ranges which it is impossible to quantify in any meaningful fashion, but which are undoubtedly wider than those implicit in the rounding to multiples of \$25 million and \$5 million. Despite this problem of the approximate nature of the projections, however, it is felt that the figures offered are reasonable. It is further hoped that the errors of detail which will inevitably be disclosed by the passage of time will tend to balance out, yielding something like the general pattern which is suggested.

The consideration of individual commodities contained a number of illustrations of the extent of approximation involved in the figures suggested. Great uncertainties attach to the future of such exports as miscellaneous animal products, uranium, and miscellaneous non-ferrous metals, so that little basis existed for any projection and any which is offered cannot be regarded as more than a partly informed guess. Natural gas is another case where relatively little confidence can be felt in the projection. Even where the general lines of development are clear, the size of the increase expected for certain major exports is so great that the margin of error must be very large. In the case of petroleum, for example, exports in 1955 were valued at \$40 million. The carefully worked out submission to the Commission by Imperial Oil Limited projected crude oil exports in 1980 at 610,000 barrels daily under one assumption and at 1,610,000 barrels

daily under another. At 1955 unit values, this would mean exports at about \$545 million or \$1,435 million. The analysis in the Commission's energy study suggests a result close to the higher of these two cases and this result has been selected in the present study. In the face of the margin suggested by Imperial Oil, however, it is clear that little faith can be attached to the exact figure suggested for the projection. Much the same problems arise in quantifying the great increases expected for aluminum, iron ore, and other principal exports.

Additional difficulties are created by the problem of price developments which can be foreseen very incompletely in looking forward for 25 years, even if it is assumed that there will be no change in the general level of prices. Thus, the projections offered may not take sufficient account of price increases which may occur in such commodities as fishery products and certain forest products. On the other hand, the price of aluminum may be overstated by the assumption that the increase occurring between 1955 and August 1956 will persist. The price of gold presents a special problem. While it is necessary to assume a continuation of the present price, an increase in that price is not an impossibility over a period as long as 25 years. Such an increase could markedly affect the volume as well as the value of Canadian gold production available for export.

Canada's export prospects as suggested in this study could be seriously upset if external demand developed along lines substantially different from those implicit in a general trading environment of the nature suggested in Chapter 3. Even if the general pattern emerges as is anticipated, the way in which it develops in various of its particular aspects could exercise a significant influence upon important segments of Canadian trade. A change in the United States tariff on a particular item, for example, might mean that a major export developed more or less rapidly than is anticipated or that a minor export became vastly more important than is presently expected.

Canadian commercial and financial policies could have profound effects upon Canada's exports. In this study it has been assumed that these policies will remain broadly what they are today. Yet it must be recognized that a significant net increase in Canadian tariffs, for example, might well cause other countries to retaliate by increasing tariffs or other restrictions on their imports from Canada. Similarly, Canada might facilitate the disposal of some exports which may prove difficult to move by entering into special trading arrangements with certain countries. This, however, might cause other countries — including those more important in Canada's total export picture — to make the terms of entry of Canadian goods less attractive. Again, it is sometimes suggested that Canada should in some way or other take advantage of her strong position to extract a monopolist return on the products of her natural resources. While such action can sometimes be effective as in the "upgrading" of Canada's pulpwood exports, it might well

result in a reduction rather than in an increase in the return from the exports in question. While Canada's basic exports are in a strong position, there are in fact no monopoly situations. Attempts to exploit apparent monopolies would always run the risk of forcing customers to seek supplies elsewhere. Many examples exist of cases where the shutting off of one source of supply was followed by the development of new sources or substitutes.

Demand for Canada's exports will also be dependent upon supplies available from other sources. The general expectation emerging from Chapter 3 is that, in the light of the expected concentration on industrial development in the underdeveloped countries and the need of many of the more highly developed countries to export manufactured goods, world import demand will be particularly strong for non-agricultural basic materials. Accordingly, it is anticipated that it will be relatively easier to sell these materials in world markets and that their prices will at least be maintained relatively to the prices of manufactured goods. Canada is in a particularly favourable position to supply such materials, having the resources available at competitive costs and being located so advantageously with respect to the United States market. One of the factors helping to create this favourable outlook is the anticipated failure of United States sources of supply to keep pace with rapidly expanding United States demand. These, however, are reasonable expectations; they are not certainties. If they should prove to be wrong — if greater than anticipated supplies should be available from underdeveloped countries or if anticipated domestic shortages do not develop in the United States — the projections offered for Canada's exports could be upset. On the other hand, the strength of the demand for Canada's basic materials may have been understated.

When specific commodities are examined, other uncertainties arise with respect to the extent to which supplies will be available from competing sources. Thus, questions arise concerning United States lumber supplies, pulp and paper production from southern pine and northeastern hardwood, as well as the possible use of tropical hardwood and other sources of pulp. United States petroleum policies, petroleum resources in the Western Hemisphere outside of Canada, and political developments in the Middle East all give rise to uncertainties about oil exports. At the time of the writing of this study, developments are such as to suggest an almost unlimited demand for Canadian oil. In the case of aluminum, what is the likelihood of large scale capacity being developed close to the bauxite deposits? If the United Kingdom and continental Europe are forced to depend to a larger extent on Western Hemisphere sources of oil, will the dollar expenditures involved force these countries to reduce their spending on North American aluminum, perhaps aided by the development of soft currency sources of supply, say, in West Africa? The availability of soft currency copper on a stable basis is another source of uncertainty. Canada's

position will also be affected by the nature, cost and timing of the processes developed for the separation of iron, nickel, cobalt and chromium found together in the lateritic ores which abound in Cuba and elsewhere in the tropics. In addition, the United States domestic iron ore position and import demand will be greatly affected by the cost of processes which are developed for the treatment of domestic taconites and similar ores. The extensive interest of United States iron ore consumers in Canadian properties will, however, tend to limit any unfavourable effects on Canadian exports.

It has been suggested that a number of Canada's exports of secondary manufacturers will be volatile, *i.e.*, will be subject to considerable year-to-year variation. This is expected for primary iron and steel and for a number of iron and steel manufactures. Canada's exports of these commodities will, however, be needed, although the level of exports in any given year may well depend to a considerable extent on the credits available to underdeveloped countries. In the field of chemicals, Canada's export potential would appear to be large, but actual exports will be limited by competing needs in importing countries and by the efforts of other producing countries to capture larger shares of the world market. Here as elsewhere, uncertainties exist as to where the limit will become effective.

Another set of qualifications arises from questions of Canada's ability to supply exports in the volumes which have been suggested. It is sometimes argued that Canada's exports in the long run depend almost exclusively on Canada's ability to produce. According to this view, if the commodities are turned out, they will be sold. If this position were accepted, it would mean that the over-all export forecast could be obtained from a consideration only of anticipated production and anticipated Canadian demand. The lengthy analysis of external markets which has been carried out here would be quite unnecessary. It need hardly be said that this view has not been accepted in the present study, and that it has been felt necessary to consider the demand for Canada's exports as well as the likely availability of the goods which may be demanded.

Nevertheless, uncertainties do arise with respect to the extent to which Canadian production will be available to meet anticipated external demand. In the case of certain agricultural commodities, particularly coarse grains and meats, the forecast based upon anticipated demand has been reduced in the light of the limitations to supply which are suggested in the Commission's study on agriculture. For saw timber, there are questions concerning Canada's ability to supply. For such commodities as petroleum, natural gas, aluminum and iron ore, the projections involve production vastly greater than current levels. For petroleum and natural gas, such production could only be supported by the existence of resources yet to be discovered. Such resource discoveries and production developments are

held probable; yet they cannot be regarded as certain and it is quite possible that the projections might be badly upset.

Again, Canadian policies might develop in such a way as to affect supplies available for export. For reasons not relevant to this study, it might be argued that Canada should reduce her dependence upon United States capital and thus reduce United States control of Canadian industries. United States capital, however, has meant the development of resources which might otherwise have remained unexploited or which might be exploited only at a considerably later date. While it may be argued that the exploitation has been too rapid, technological progress is such that the possibility of the displacement of presently valuable resources, or the discovery of cheaper supplies elsewhere, cannot be ignored. In any event, United States and other external capital has facilitated the development of Canadian resources for export. In particular, the development of these resources by the user of the commodity or by associated interests, as in the case of the Iron Ore Company of Canada, has facilitated access to export markets and meant an increase in Canada's exports. The export projections in this study are predicated on a continued resource development and facilities for the sale of the commodities, particularly in the United States. A significant change in Canada's attitude toward the inflow of foreign capital could affect the projections. Similarly, a change in Canadian attitude toward the export of other commodities, for example, natural gas and hydro-electric power, might result in a change in export expectations in either direction. A modification of the tax structure or of commercial policy which altered costs to any important extent in an export industry would have obvious consequences.

These various uncertainties are not raised to suggest that the future of Canada's major exports is bleak. Rather it is very bright. Indeed, the patterns of anticipated world demand and expected competing supplies appear to be such that the picture today looks very different from what it did at the end of the 1930's. The vulnerability of Canada's exports as seen at that time was noted in the first chapter of this study. Today, non-agricultural basic materials, upon which so much of Canada's export trade depends, appear — as has been suggested — to be the very commodities for which a high level of demand is to be expected.² Further, it has been suggested that the concentration of exports upon the United States does not imply as much vulnerability as it used to.³ This is not to suggest that the prices of basic commodities will in some miraculous fashion become stable, but rather that, under assumed conditions, they will be in relatively strong demand and that Canada is fortunate in the composition of her potential exports. For the future, more volatility is expected in Canada's exports of the products of secondary industry than in the basic materials — which will be needed in such large quantities if full employment continues to be maintained through-

² See p. 109.

³ See Section III (d) of Chap. 1.

out the world without artificial stimulation. At the same time, however, it would be incorrect to suggest that the picture in 1980 can be foreseen with precision in the face of the many uncertainties which exist. The elements of the forecast are subject to wide margins of error, and the one thing that is certain is that events will prove the projections inaccurate in detail. In the aggregate, however, it is hoped that the broad conclusions which emerge from them will stand up.

Quite apart from the various qualifications which have been reviewed so far in this section, it may be argued that the projections which have been presented understate the likely magnitude of Canada's exports in 1980. In the first place, it may be that not enough consideration has been given to the possibility of the development of completely new exports or the tremendous growth of certain exports which are presently of only minor importance. In part, such developments of unknown products have been taken into account in the foregoing projections, particularly in that for "other non-ferrous metals". While a growth in thorium exports, for example, might be paralleled by a reduced demand for uranium oxide, sufficient allowance may still not have been made for new exports. Not unrelated to this are the limits which have been placed on the expansion of certain exports as a result of the expectation that overseas countries will not have unlimited resources with which to buy dollar commodities. Thus, notions of balance of payments limitations in overseas countries have held down the projections for the export of such commodities as newsprint, chemicals and sundry manufactures. In addition, they have prevented the inclusion of projections for exports of titanium metal and uranium metal (or U-235). This balance of payments limitation, however, has been applied without the development of a precise notion of what balance of payments problems are likely to exist in 1980, and it is now appropriate that this matter be considered.

III. Exports and the Balance of Payments: the Adjusted Forecast

(a) Balance of Payments Adjustments to Merchandise Exports

The nature of the adjustments to make the export data more appropriate for balance of payments purposes were described briefly in Chapter 1. More detail can be seen in the balance of payments publications of the D.B.S. The balance of payments adjustments for 1954 and 1955 are indicated by the table on the following page.

The table shows that the net effects of the balance of payments adjustments to Canada's merchandise exports in recent years have been relatively small, \$18 million in 1954 and \$19 million in 1955. In both cases, these net adjustments were deductions from the figures contained in *Trade of Canada*, the total operation being dominated by the removal from the trade statistics of the non-commercial item, settlers' effects. The over-all deduction of \$19 million in 1955 was allocated as follows: \$14 million from exports to

***Balance of Payments Adjustments to Merchandise Exports,
1954 and 1955***

(millions of Canadian dollars)

	1954	1955
Domestic exports (<i>Trade of Canada</i>).....	3,881.3	4,281.8
Re-exports (<i>Trade of Canada</i>).....	65.6	69.5
Total.....	3,946.9	4,351.3
<i>Balance of Payments Adjustments</i>		
Tourist exports.....	— 3.0	— 2.8
Settlers' effects.....	—17.3	—21.9
Private donations.....	— 2.7	— 1.5
Warehousing.....	+ 5.0	+ 4.2
Other adjustments.....	+ 0.2	+ 2.8
Adjusted total merchandise exports.....	3,929.1	4,332.1

SOURCE: D.B.S., *The Canadian Balance of International Payments, 1955, and International Investment Position*, p. 11.

the United States, \$2 million from exports to the United Kingdom and \$3 million from exports to other countries.

For the future, it is assumed that a reasonable approximation to the balance of payments adjustments can be obtained by removing the non-commercial items which were included in the total of domestic merchandise exports. This assumes that tourist exports (moved to the travel account in the balance of payments) will be balanced by the other adjustments. Accordingly, total merchandise exports as arrived at in Part B are reduced by \$75 million, the amount of the non-commercial items included in that total.⁴ This reduction is allocated among the major trading areas on the basis of the distribution of exports of non-commercial items in 1955. The resulting data for 1980 merchandise exports, adjusted for balance of payments purposes, are as follows.

***Balance of Payments Adjustments to Merchandise Exports,
Projections for 1980***

(millions of Canadian dollars)

	Total	U.S.	U.K.	Others
Domestic exports.....	10,375	7,045	1,440	1,890
Re-exports.....	175	140	10	25
Total.....	10,550	7,185	1,450	1,915
Net balance of payments adjustments.....	— 75	—55	— 5	—15
Adjusted total.....	10,475	7,130	1,445	1,900

(b) Other Current Receipts

For the year 1955, the Canadian balance of payments shows that Canada's current account receipts on items other than merchandise trade aggregated

⁴ See Part B, Section 31.

\$1.5 billion. This excludes Mutual Aid to NATO countries which appears on both the receipts and the payments sides of the current account. The items remaining are: gold production available for export, \$155 million; travel expenditures, \$328 million; interest and dividends, \$160 million; freight and shipping, \$385 million; inheritances and immigrants' funds, \$86 million; and all other current receipts, \$393 million.

A projection for the value of *new gold production available for export* is contained in Section 32 of Part B. There it is suggested that, assuming a continuation of the present price of gold and of present governmental policy with respect to gold, the value of these receipts might decline from \$155 million in 1955 to \$125 million in 1980. As in the past, the whole of these receipts is placed in the current account with the United States.

As regards the remaining, "invisible", items on the receipts side of the current account of the balance of payments, projections are offered without much foundation, in part, because of the difficulties inherent in estimating the future of these magnitudes. This applies both to the over-all projections and to the area breakdown. They are presented merely as illustrative figures which may, however, be used to arrive at a projection of total current receipts for comparison with forecasts for total current payments in order to see whether the projections for exports of goods and services meet the test of balance of payments reasonableness. Subject to these remarks, the following projections are offered.

Of the \$328 million receipts from *travel and tourism* in 1955, \$303 million came from residents of the United States, \$13 million from the United Kingdom, and \$12 million from other countries. While it is possible that United States residents will spend increasing proportions of their travel funds outside North America, increasing incomes and leisure may be expected to mean increasing tourism and a very large increase in the amount spent in Canada — provided that Canadian facilities can be expanded. Accordingly, 1980 travel receipts are projected at \$800 million, with the great bulk of the total continuing to come from the United States. The small 1955 shares from the United Kingdom and other overseas countries are increased very slightly in the suggested distribution: \$730 million from the United States and \$35 million each from the United Kingdom and from all other countries.

Receipts from *interest and dividends* in 1955 aggregated \$160 million divided as follows.

Canada's 1955 Receipts on Interest and Dividend Account
(millions of Canadian dollars)

	Interest	Dividends	Total
From: the United States	16	66	82
the United Kingdom	25	13	38
other countries	14	26	40
all countries	55	105	160

As repayment on Canada's postwar loans occurs, the interest component of these receipts will decline, unless new loans are extended or Canadians increase their holdings of foreign interest-bearing securities. On the other hand, Canadian direct investment abroad is expected to grow. In each of the years 1953-55, such investment exceeded \$60 million, despite the substantial net inflows of capital into Canada. Continued investment abroad should raise dividend receipts. Slightly more than a doubling of these receipts (dividends and interest) is suggested for 1980, with the growth from the United States much more rapid than that from overseas. The projected distribution is \$240 million from the United States, \$50 million from the United Kingdom and \$60 million from other countries, the total being \$350 million.

Canada's *freight and shipping* earnings in 1954 and 1955 may be summarized as follows.

Canada's Freight and Shipping Receipts
(millions of Canadian dollars)

	1954	1955
Canadian operated ships.....	82	107
Expenditures of foreign ships in Canada.....	35	42
Inland freight on exports.....	159	185
Intransit revenues.....	29	30
Other receipts.....	8	21
Total receipts.....	313	385

Of the \$385 million total in 1955, \$199 million was from the United States, \$94 million from the United Kingdom, and \$92 million from other countries. Many factors will affect the size of these receipts in 1980. Other things being equal, such receipts might rise with exports. But other things will not be equal. In the first place, the composition of exports is expected to alter, with a further decline in the relative importance of agricultural commodities and a rise in such items as petroleum, natural gas, aluminum, uranium and iron ore. These changes, and changes in destination, will affect both inland and ocean revenues. Precise allowance for them would be difficult, however, since it is not yet known what routes will be travelled by oil and gas pipelines, where new aluminum facilities will be located, what conditions will govern uranium exports, or whose carriers will move Canada's iron ore. Earnings will be affected by conditions determining the size of Canada's merchant fleet. The St. Lawrence Seaway will have effects which cannot yet be measured — perhaps reducing direct earnings below what they might otherwise be, but raising expenditures of foreign ships in Canada.

If, despite these many changes and uncertainties, it were decided to project freight receipts from 1955 on the basis of the increase in the value of exports to the three major areas, the 1980 freight projections would be

\$545 million from the United States, \$175 million from the United Kingdom, and \$180 million from other countries. An apparent obvious shortcoming of such a procedure is that pipeline earnings might well account for most of the amount thus projected as receipts from the United States.⁵ If, for the sake of argument, it is assumed that freight charges on oil exports will be 50c a barrel and, on gas exports, equal to the price received at the field, the exports of these commodities projected in Part B would imply pipeline earnings in the United States freight and shipping account aggregating about \$465 million. This makes a projection of total receipts from the United States of \$545 million look too small. In view of the many uncertainties, it is not felt appropriate to calculate a figure based on \$465 million plus the increase in the balance of freight receipts proportionate to the projected increase in the balance of exports to the United States. It would seem appropriate, however, to use a figure higher than \$545 million and, with little confidence in the exact figure, \$200 million is added. Accordingly, receipts from freight and shipping in 1980 are projected at \$1,100 million: \$745 million from the United States; \$175 million from the United Kingdom; and \$180 million from other countries.

Receipts from *inheritances and immigrants' funds* amounted in 1955 to \$86 million, of which \$45 million was from the United States, \$20 million from the United Kingdom, and \$21 million from other countries. For 1980, these receipts are projected at \$200 million: \$120 million from the United States and \$40 million each from the United Kingdom and all other countries, there having been a tendency in recent years for receipts from the United States to rise as a percentage of the total.

Finally, there are the *miscellaneous receipts* which have grown to \$393 million in 1955. For 1954 and 1955, these receipts may be broken down as follows.

Canada's Miscellaneous Current Receipts
(millions of Canadian dollars)

	1954	1955
Government transactions, n.o.p.	118	195
Personal and institutional remittances	22	22
Miscellaneous income (a)	33	40
Business services and other transactions	125	136
Total	298	393

(a) Including transfers of branch profits by insurance companies and banks.

A major factor increasing receipts between 1954 and 1955 was a higher level of spending by the United States Government for defence installations in

⁵ To the extent that these earnings were in fact received by foreigners, there would be an offset in the balance of payments in the interest and dividend payments account, as would be the case with respect to other foreign direct investments in Canada.

Canada, increasing the receipts from "government transactions, n.o.p.". The distribution in 1955 was \$314 million from the United States, \$43 million from the United Kingdom, and \$36 million from other countries. The inclusion in this item of United States defence spending makes prediction particularly difficult. With little solid basis, it is suggested that receipts from the United States will slightly more than double by 1980 and those from other countries will increase more moderately, yielding \$640 million from the United States, \$60 million from the United Kingdom, \$50 million from other countries, and a total of \$750 million.

In *summary*, the projections for current receipts other than merchandise and gold yield results which are compared with 1955 in the following table.

Current Invisible Receipts, 1955 and Projections for 1980
(millions of Canadian dollars)

	1955	1980
From: the United States	943	2,475
the United Kingdom	208	360
other countries	201	365
all countries	1,352	3,200

(c) *Current Payments*

Projections for imports of goods and services, by major areas in Canada's trade, are contained in the Commission's study on imports. Data in that study are considered net of Mutual Aid to NATO countries. Thus the treatment of that item is consistent with its exclusion from the receipts side in this chapter. Further, as also seems to be appropriate for present purposes, current payments in the import study do not include official contributions. One modification, however, is necessary to the data in the import study which are set up on a basis appropriate to the national accounts rather than to the balance of payments. This is the addition of inheritances and emigrants' funds. In 1955, these payments totalled \$101 million, of which \$78 million went to the United States, \$16 million to the United Kingdom, and \$7 million to other countries. For 1980, this item is projected at \$200 million or the same amount as the projection for receipts from inheritances and immigrants' funds. The distribution of the payments item, however — \$155 million to the United States, \$30 million to the United Kingdom, and \$15 million to other countries, on the basis of the 1955 shares — differs from that employed for the receipts.

With this addition, the data on current payments obtained from the import study are as follows.

Canada's Current Payments, 1955 and Projections for 1980
(millions of Canadian dollars)

	1955	1980
Merchandise imports (adjusted for balance of payments purposes)		
United States.....	3,280	8,053
United Kingdom.....	405	1,015
Other countries.....	855	1,501
Total.....	4,540	10,569
Other current payments		
United States.....	1,457	3,628
United Kingdom.....	234	581
Other countries.....	276	566
Total.....	1,967	4,775
Total current payments		
United States.....	4,737	11,681
United Kingdom.....	639	1,596
Other countries.....	1,131	2,067
Total.....	6,507	15,344

(d) The Current Account of the Balance of Payments

Having considered current receipts and current payments, it is now possible to construct the current account of the balance of payments as projected for 1980. Again it is stressed that many of the figures are little more than illustrative, indicating what are felt to be reasonable possibilities for the total magnitudes and the area breakdown. With this qualification, and more detailed ones given above and in the Commission's import study, the following balance of payments statement (Table 4) is presented. In setting up the statement, the import and other payments projections have been rounded to multiples of \$5 million. The significance of the last two lines on the table will be discussed in Subsection (e).

On the basis of the analysis to this point, it is suggested that merchandise exports will grow slightly more rapidly than imports (both adjusted for balance of payments purposes), so that the deficit with all countries on trade account (line 3 of the table) will be reduced from \$208 million in 1955 to about \$95 million in 1980. Behind this is a moderate increase in the trade deficit with the United States, a small increase in the surplus with the United Kingdom, and a more substantial rise in the surplus with other countries (in part relating to the anticipated decline in the importance of petroleum imports). The small reduction in the over-all trade deficit, however, is more than offset by the anticipated decline in new gold production available for export and the increase in the invisible deficit. The invisible deficit would rise, despite the fact that payments are expected to grow only slightly more rapidly than receipts, because of the application of these rates of growth

Table 4

**CURRENT ACCOUNT OF CANADA'S BALANCE OF PAYMENTS, 1955
AND PROJECTIONS FOR 1980**
(*millions of Canadian dollars*)

	1955			1980				
	Total	U.S.	U.K.	Others	Total	U.S.	U.K.	Others
1. Merchandise exports (adjusted).....	+4,332	+2,598	+772	+962	+10,475	+7,130	+1,445	+1,900
2. Merchandise imports (adjusted).....	-4,540	-3,280	-405	-855	-10,570	-8,055	-1,015	-1,500
3. Merchandise balance.....	- 208	- 682	+367	+107	- 95	- 925	+ 430	+ 400
4. Gold production available for export.....	+ 155	+ 155	—	—	+ 125	+ 125	—	—
5. Other current receipts.....	+1,352	+ 943	+208	+201	+ 3,200	+2,475	+ 360	+ 365
6. Other current payments.....	-1,967	-1,457	-234	-276	- 4,775	-3,630	- 580	- 565
7. Current account balance.....	- 668	-1,041	+341	+ 32	- 1,545	-1,955	+ 210	+ 200
8. Further adjustment to export forecast.....					+ 545	+ 255	+ 190	+ 100
9. Adjusted current account balance.....					- 1,000	-1,700	+ 400	+ 300

NOTE: Data exclude Mutual Aid to NATO countries and official contributions. Data for 1955 are as contained in D.B.S., *The Canadian Balance of International Payments, 1955, and International Investment Position*. The derivation of the projections is as indicated in the text.

to a present situation where payments exceed receipts. Thus, the total deficit with all countries on current account (line 7 of the table) is projected as increasing by about one and one-third times, from \$668 million in 1955 to about \$1,545 million in 1980. By areas, the current deficit with the United States would almost double to about \$1,955 million, the surplus with the United Kingdom would fall to about \$210 million, and the surplus with other countries would rise severalfold to about \$200 million.

It is now necessary to return to the issues raised at the end of Section II of this chapter and to consider the further adjustment of the export projections.

(e) Further Adjustment to the Export Forecast

In the closing paragraph of Section II it was suggested that the projections for commodity exports may, in the aggregate, be too pessimistic. It may well be that insufficient allowance has been made for the development of new exports which, in the consideration in Part B, are not expected to be significant or are not foreseen at all. Some allowance has been made for such developments, especially in the projection for "other non-ferrous metals" in Section 23 of Part B. Nevertheless, even one new commodity which played such a role as is being assigned to petroleum, aluminum or iron ore could render the aggregate forecast too low, unless it tended to displace other exports. Not wholly unrelated to this, balance of payments considerations in overseas countries and United States commercial policy as it affects manufactures have resulted in a restraint being placed on the projections for both potential and existing exports. Thus no figure has been included for uranium in metallic form (or U-235) or for titanium metal. Yet Canada's hydro-electric facilities might well be employed to produce these products, particularly for the United Kingdom, if there were no concern over how the exports would be paid for.

Similarly, projections for exports of newsprint and aluminum to overseas countries have been held down by balance of payments considerations. Chemicals and sundry manufactures have also been projected at less than they might have been under different assumptions about overseas payments and United States commercial policy. Quite apart from the development of other new exports, these items could easily add over \$1 billion to Canada's 1980 exports under more favourable expectations about underlying conditions. Additionally, it seems probable that, if Canadian available supplies could exceed expectations, exports of coarse grains, meats and fish could exceed the projections. Lumber exports, also, might well be higher than projected if larger supplies were available in Canada.

The foregoing points to a contributor to the margins of error — at least those in an upward direction — which are implied in the projections. It is possible, however, to make some over-all adjustment to take account of these considerations.

For the United Kingdom and other overseas countries as a group, payments considerations must have an important bearing on the extent to which they will purchase additional Canadian goods. The ability of these countries as a group to make current payments to Canada in excess of their current receipts from Canada will depend upon their capital account transactions with Canada, the level of new gold production outside North America, and the balance of their total (current plus capital) transactions with the United States. In recent years, capital transactions with Canada have added to the over-all deficit of overseas countries, but new gold production and net outpayments by the United States have more than covered this deficit. For the United Kingdom, the relevant factors are capital transactions with Canada, and the U.K. balance of payments with all countries other than Canada — the extent to which it yields the means for settling a deficit with Canada. Again, in recent years, the United Kingdom has been able to finance both current and capital account deficits with Canada.

A forecast of these determinants of the payments position *vis-a-vis* Canada for the United Kingdom and for other overseas countries — preferably individually — is not possible within the scope of this study. Instead, the procedure is to make directly a rough estimate of the deficits which they might support in their 1980 current account transactions with Canada. In considering this matter, it is assumed, as suggested in Chapter 3, that total transactions between the United States and the rest of the world will continue to result in a net outflow of United States dollars. This, together with new gold production, is expected to enable overseas countries as a group to cover deficits with Canada and also to increase their exchange reserves.

In line 7 of Table 4, it was suggested that, before the adjustment now being considered, Canada's 1980 current account surplus with the United Kingdom might amount to about \$210 million. This is less than the surplus of \$341 million in 1955, but slightly exceeds the average for the previous five years, when the figure varied between \$24 million in 1950 and \$388 million in 1952 and averaged just under \$200 million. For the future, it is anticipated that Canada will continue to run a current account surplus with the United Kingdom and that this may exceed the 1955 level. The rate of increase, however, is not expected to be great — nothing like that in the total value of transactions between Canada and the United Kingdom. This view is based upon the expectation that U.K. policy will continue to aim at a reduction of the deficit with Canada. As \$400 million appears to be a reasonable level at which to forecast Canada's 1980 current account surplus with the United Kingdom, it is suggested that current receipts might be increased by \$190 million above the level so far projected. This would not be sufficient to cover all potential exports. It is felt, however, that the substantial growth in Canada's import and other current payments to the United Kingdom, which is involved in the projections incorporated in Table 4,

represents about all that is possible on the payments side. If this is so, and if a Canadian surplus of \$400 million is, in fact, reasonable, it would appear to follow that the United Kingdom will have to limit payments for goods and services from Canada in some fashion or other to the adjusted level which is now suggested, *i.e.*, to about \$2 billion.

The surplus which Canada runs with the group of countries other than the United States and the United Kingdom is the net result of surpluses with some countries partly offset by deficits with others. The diverse relations with different countries and the strains which may develop tend to be obscured by the use of over-all figures. For what the data are worth, however, it may be noted that Canada's net current account surplus with these countries (excluding official contributions) rose from \$47 million in 1950 to \$641 million in 1952 and then declined to \$32 million in 1955, averaging \$242 million over the period. The 1952 surplus of \$129 million with other sterling area countries fell to \$82 million in 1955, the surplus of \$333 million with Continental O.E.E.C. countries dropped to \$31 million, while the \$179 million surplus with all other countries was replaced by a 1955 deficit of \$81 million. The wide fluctuations in the past and the heterogeneity of the constituents make Canada's net 1980 current account surplus with these countries most difficult to forecast. A factor affecting its size will be the level of Canadian assistance to other countries, *e.g.*, through the Colombo Plan. Despite the uncertainties, however, and the low level of the surplus in 1955, it is suggested that it might rise to somewhat above its 1950-55 average — say, to \$300 million. This would mean that total current receipts, on the basis of which the current surplus of \$200 million in line 7 of Table 4 was calculated, might be raised by \$100 million.

There remains the question of what further adjustment, if any, should be made to current account receipts from the United States. As long as the United States dollar retains its position as a medium for international settlement and as a reserve currency, there is no question of a balance of payments limitation to the size of Canada's exports to the United States. There is, however, the possibility that the projections may have been based upon an overly pessimistic appraisal of the future of United States commercial policy and, perhaps more important, that they do not take sufficiently into account the development of new exports. Some upward adjustment may well be appropriate.

To arrive at this final adjustment, it is suggested that \$1 billion represents about the maximum current account deficit which Canada is likely to run in 1980. This is the difference between imports and exports of goods and services which has been incorporated in the Commission's projections of G.N.E., and it would seem to be a reasonable maximum for the deficit on the basis of the examination of the illustrative magnitudes for the current

account of the balance of payments.⁶ It is felt to be a maximum because it allows for only a modest further adjustment of exports to the United States to take account of new products and additional exports of processed materials and manufactures. A deficit of this magnitude would be consistent with a reduced dependence by Canada on new inflows of foreign capital. On the other hand, some net capital inflow, *i.e.*, some excess of imports of goods and services over exports of goods and services, is consistent with, and possibly implicit in, the rapid rate of Canadian expansion which the Commission's national accounts projections anticipate will be continuing in 1980.

An over-all current account deficit at a maximum of \$1 billion, a surplus with the United Kingdom of \$400 million, and a surplus with other overseas countries of \$300 million mean that the deficit with the United States is to be projected at a maximum of \$1,700 million. Thus, the adjustment to the deficit shown in line 7 of Table 4 is a minimum increase of \$255 million in current receipts from the United States.

These further adjustments to Canada's projected current account receipts and the resulting current account balances are set down in lines 8 and 9 of Table 4. These adjustments affect total current receipts and may imply increased invisible earnings as well as increased merchandise exports. Indeed, increased merchandise exports would presumably mean larger receipts in the freight and shipping account. The basis of the increase, however, is largely in the merchandise account and little is lost if it is assumed that it falls entirely on commodity exports. No attempt is made to allocate it among commodities. While some likely candidates have been mentioned above, it has also been noted that others may not yet be known. In general, however, most of the adjustment may well fall within the metals and minerals group.

If the whole of the further adjustment is applied to domestic merchandise exports, the following results are obtained.

*Canada's Exports of Goods, Projections for 1980
after the Further Adjustment
(millions of Canadian dollars)*

	Total	U.S.	U.K.	Others
Merchandise exports (adjusted for balance of payments purposes)	11,020	7,385	1,635	2,000
Domestic merchandise exports	10,920	7,300	1,630	1,990
New gold production available for export	125	125	—	—
Total domestic exports	11,045	7,425	1,630	1,990
Re-exports	175	140	10	25
Total exports of goods (unadjusted for balance of payments purposes)	11,220	7,565	1,640	2,015

⁶ This ignores the fact that imports of goods and services in the National Accounts include official contributions. The degree of approximation in the projections is such, however, that this is not felt to be significant. As the National Accounts exclude Mutual Aid to NATO countries from both exports and imports and as inheritances and migrants' funds (excluded by the National Accounts) are projected at the same figure for both receipts and payments, no other inconsistencies arise.

IV. Implications of the Adjusted Forecast

(a) Over-all Magnitudes

Including the whole of the adjustment proposed in the preceding subsection, Canada's domestic merchandise exports are projected as growing from about \$4.3 billion in 1955 to about \$10.9 billion in 1980, an increase of 155%. As noted in Section I (a) of this chapter, anticipated price changes have been taken into account in arriving at the projections. These, however, have had a relatively minor effect, perhaps accounting for an increase of about \$400 million (net) in the aggregate. If this amount were removed, the projections would still imply a volume increase of about 145% over the 25-year period. This increase compares with a 78% growth in volume over the 27 years from 1928 to 1955. The much more rapid rate projected for the future is perhaps a reason for caution, or another qualification to be added to those in Section II.

It should be noted, however, that the growth in the over-all volume of Canada's exports over the period 1928 to 1955 was held down by the absolute decline in the volume of agricultural and animal products, which were so important in 1928. If exports other than these items are considered, the volume increase was 180% over the 27-year period.⁷ For the future, a somewhat more rapid rate of increase is being projected in the volume of these non-agricultural, non-animal exports. While uncertainties arise in the calculation, it works out to a rate of growth of 183% over 25 years or about 208% over 27 years.

There would appear to be some justification for anticipating a more rapid rate of growth of non-agricultural exports than has been experienced in the past. The next 25 years are expected to see Canada reap the fruits of the resource developments of the postwar period and those of the continued activity in this field which appears to be virtually certain. The future may not see as rapid relative growth in such exports as aluminum, iron ore and chemicals as was experienced in the past. Nevertheless, future rates of increase are expected to be great and to be accompanied by very great increases in other non-agricultural resource-based exports. This expectation appears especially to be reasonable in the light of the assumption of con-

⁷ The relevant calculation is as follows.

	1928	1955
Total exports		
Current values (\$ million).....	1,339.0	4,281.8
Price index (1948=100).....	65.4	117.5
Value in 1948 dollars (millions).....	2,047.4	3,644.1
percentage increase.....		78
Agricultural and animal products (a)		
Adjusted current values (\$ million).....	783.4	1,006.1
Price index (1948=100).....	70.1	96.5
Value in 1948 dollars (millions).....	1,117.5	1,042.6
percentage decrease.....		7
Exports other than agricultural and animal products		
Value in 1948 dollars (millions).....	929.9	2,601.5
percentage increase.....		180

(a) D.B.S. "main groups" agricultural and vegetable products and animals and animal products, less rubber and its products.

SOURCE: Dominion Bureau of Statistics, *Review of Foreign Trade, First Half Year, 1954*, pp. 26-27, and *Calendar Year, 1955*, pp. 51 and 56.

tinued worldwide full employment and a high level of world trade. While Canada's export may well grow faster than the level of world trade, it is to be noted that these exports include a high proportion of commodities which are expected to be in very strong world demand, with so much concentration both in developed and underdeveloped countries on the production of manufactures. Further, Canada is in a favourable position geographically and strategically with respect to the United States, the world's largest import market and that in which the greatest absolute growth is to be expected. The Canadian export position is further aided by the relative exhaustion of United States domestic supplies of many of the goods which can be exported from Canada, and by the activity of United States users of these commodities in securing sources of supply in Canada.

The future rapid rate of growth of non-agricultural exports cannot be offset by a decline in exports of agricultural and animal products to the extent that it was over the period of 1928 to 1955. The decline which has already taken place in the relative importance of agricultural and animal products among Canada's total exports makes such an offset a statistical impossibility. Further, in contrast to the small decline in the volume of agricultural and animal exports between 1928 and 1955, a moderate increase is expected between 1955 and 1980. Thus, an increase in Canada's total domestic merchandise exports of something like 150%, *i.e.*, an increase to two and one-half times their 1955 level, would seem to be a not unreasonable expectation.

In value terms, the export projections after the adjustment in Subsection III (e) imply, as has been noted, an increase between 1955 and 1980 of 155% for domestic merchandise exports. If new gold production available for export is added, the rate of increase is about 149%. If re-exports are added to obtain total exports of goods including gold, the rate of increase is again 149%. Merchandise exports (domestic exports plus re-exports) when adjusted for balance of payments purposes yield a rate of increase of 154%. If gold is added to obtain total exports of goods adjusted for balance of payments or national accounts purposes, the rate of increase suggested is 148%.

(b) Exports and Gross National Product

In Subsection I (c) of Chapter 1, it was noted that in the 30 years prior to 1955 there was a drift downward in the contribution of exports to G.N.E. or in the percentage of G.N.E. constituted by exports. For the next 25 years, a continuation of this downward drift is anticipated, although the rate of decline is expected to be slower. From 1926-28 to 1955, exports of goods, including gold, declined from 23.1% of G.N.E. to 16.8%. Exports of goods, including all of the adjustment worked out in Subsection III (e), and including new gold production available for export and adjusted for balance of payments or national accounts purposes, are projected at \$11,145

million for 1980; for the same year, the Commission's forecast of G.N.E. is \$76.1 billion (in 1955 dollars). Although some price changes have been allowed for in individual commodities, the export forecast is also in 1955 dollars in the sense that it assumes an unchanged general level of prices. Thus, the export projections involve the ratio of exports of goods to G.N.E. declining from 16.8% in 1955 to 14.6% in 1980. This is a decline in the relative importance of exports of 13%, as compared to the 27% decline between 1926-28 and 1955. It has been suggested, however, that the amount of the adjustment to exports in Subsection III (e) is a minimum figure, so that the decline relative to G.N.E. may not be as great as has been indicated. Yet, some relative decline does appear to be likely, and, even if exports of goods are increased by a further \$1 billion to a level of \$12,145 million, sufficient to wipe out the projected current account deficit, they would still decline by about 5% in relation to G.N.E., or to 16.0% of G.N.E.

Excluding inheritances and immigrants' funds, exports of goods and services projected for 1980 show declines in their importance relative to G.N.E. similar to those for exports of goods. Again, these declines are at a slower rate than those over the 30 years prior to 1955. The adjusted figure for exports of goods and services in 1980 is \$14,145 million. This would be 18.6% of G.N.E. projected at \$76.1 billion, as compared with a 1955 relationship of 21.5%. If exports were increased to eliminate the whole of the current account deficit, the percentage would be 19.9.

After the adjustment proposed in Subsection III (e), the projections in this study suggest a continued moderate decline in the importance of exports of goods and services as a determinant of G.N.P. At the same time, however, the projections in the Commission's import study suggest a slightly more rapid relative decline in imports of goods and services. If, in fact, the relative drop in exports is more than offset by that in imports, it follows that there would also be a decline in the total contributions to G.N.E. by consumption, government spending, and gross domestic investment. This latter decline, however, would be very slight, 1.2% of G.N.E. as compared with the decline in exports of goods and services amounting to 2.9% of G.N.E.

(c) Commodity Composition of Exports

Data in Table 3 suggest that, prior to the adjustment of Subsection III (e), much the largest items among Canada's 1980 exports will be petroleum and products, newsprint, and aluminum and products. These items are also expected to account for the greatest absolute increases in export values. In 1955 these three items accounted for 21% of Canada's domestic exports including new gold production available for export. The projections in Table 3 imply that in 1980 they will account for 33% of the total, adjusted

as in Subsection III (e) above.⁸ If three other major exports — lumber, wood pulp and iron ore — are added to the list, these six commodities are projected as rising from 38% of Canada's domestic exports in 1955 (and 18% in 1928) to a 1980 level of 49%, or probably over half if any of the adjustment to the export projections applies to aluminum. It is perhaps of interest that Canada's six major exports in 1955 also accounted for 49% of the total. The 1955 commodities were wheat and wheat flour, lumber, wood pulp, newsprint, aluminum and nickel.⁹ Thus, as far as the six largest items are concerned, the next 25 years are not expected to bring a reduction in the commodity concentration of Canada's exports. The list changes, with wheat and wheat flour and nickel being replaced by petroleum and iron ore. Nevertheless, the first six commodities appear likely to account for about half of Canada's export in 1980 just as they did in 1955.

It was stressed in Section II of this chapter that great uncertainties attach to the future of all exports, so that the detailed commodity projections now being considered are undoubtedly subject to significant margins of error. The uncertainties apply particularly to such exports as natural gas, titanium and uranium, as well as to those which are considered in the foregoing paragraph and for which such large absolute increases are being projected. In none of the projections, however, is it possible to feel anything like complete confidence. With the reminder of these qualifications, the implications of the commodity projections summarized in Table 3 and subsequently adjusted may now be considered further.

Considering broad commodity groups, much the greatest absolute and relative increases anticipated among Canada's exports are in the field of metals and minerals. For present purposes, this group includes petroleum and products; asbestos, natural gas and other non-metallic minerals and products; aluminum and products; copper and products; nickel; uranium oxide; lead, platinum, silver, zinc, and other non-ferrous metals and their products, excluding gold and electrical apparatus; and iron ore. This group of exports as a whole is projected as increasing at a minimum of 320% between 1955 and 1980 and rising from 26% of total domestic exports to at least 43%. Further, as much of the adjustment to exports suggested in Subsection III (e) is expected to fall within this group, the increase might be as high as 370% and these exports might constitute as much as 48% of the total. These projections thus envisage Canada's exports of metals and minerals increasing to between four and five times the 1955 level, almost doubling in relative importance and constituting almost half of Canada's total domestic exports in 1980.

⁸ In all comparisons in this subsection, total domestic exports are taken as including domestic merchandise exports and new gold production available for export. The 1980 total also includes the adjustment suggested in Subsection III (e). Thus total domestic exports for this purpose are \$4,437 million in 1955 and \$11,045 million for 1980.

⁹ See Table 1. In determining the six major exports in both years, such basket items as chemicals and sundry manufactures are excluded.

The only other export groups projected as increasing their relative importance in the face of the tremendous growth of metals and minerals are chemicals (fertilizers, synthetic rubber and other chemicals and allied products, but excluding uranium) and the relatively small "other domestic exports". Under the projections, chemical exports would increase by 224%, as compared with the increase of 149% for total exports, and would rise from 4.2% of the 1955 total to 5.4% of the total in 1980. The small relative increase in other domestic exports is to be explained by the anticipated rise in the export price of electricity and the nature of the rounding operation performed in the projection for non-commercial items.

Among the export groups expected to lose ground relatively between 1955 and 1980 is that covering forest products, the most important group among Canada's present exports. This group is expected to rise in value only by about 80% and to decline from 34% of total exports to 25%. Thus, forest products would become less important than non-ferrous metals plus iron ore. Further, part of the increase projected results from an anticipated increase in prices. It is possible, however, that the value of exports in 1980 might exceed that projected, if lumber prices should rise more rapidly than anticipated, if lumber should be available in Canada in larger quantities, or if overseas countries were able to purchase larger quantities of newsprint.

Other relative declines between 1955 and 1980 are anticipated in primary iron and steel and sundry manufactures, both of which are expected about to double in value between these years. Exports of agricultural and animal products are expected to increase by only 24% so that they would decline from 21% of the total in 1955 to less than 11% in 1980. Wheat and wheat flour are expected to drop to little more than 4% of total domestic exports, in contrast to 9% in 1955 and 36% in 1928. Finally, the projections involve an absolute decline of almost 20% in the value of Canada's new gold production available for export, so that this item would fall from 3.5% of the total in 1955 to about 1% in 1980.

The anticipated rise in the relative importance of metals and minerals is greater than the relative decline in forest products, so that these two groups together would increase their importance from about 60% of the total of Canada's exports in 1955 to perhaps 70% or more in 1980. This net change is expected to be offset by the relative declines in agricultural and animal products and in gold. In the field of manufactures, the increasing share projected for chemical exports almost offsets the declines in the importance of primary iron and steel and sundry manufactures. While it may be that the projection for chemicals is too optimistic, it is also possible that an insufficient increase has been projected for sundry manufactures.

The possibility of the increased processing of the products of Canada's non-agricultural basic industries before export is considered in other Commission studies and the questions which arise need not be treated here.

In general, however, it is expected that protectionism in other countries and the market orientation of the processing facilities will mean that, while there may be some increase in this activity in Canada, it will be relatively modest in comparison with the growth anticipated for total exports. A further reduction in foreign tariffs and other restrictions could, however, result in considerably more processing taking place in Canada, particularly in the conversion of ores into refined metals and in the production of higher grades of paper. Even with anticipated commercial and financial policy abroad, there may be a relative increase in this activity.

In any event, basic materials in raw or processed form are expected to continue to dominate Canada's exports. Yet, for the reasons suggested in Section II of this chapter, this fact is not felt to mean anything like the instability in the Canadian export picture that was seen in the prewar period. Indeed, Canada would seem to be very fortunate to be in a position to export needed basic materials.

(d) *The Area Distribution of Exports*¹⁰

The projections for the distribution in 1980 of Canada's domestic merchandise exports as among the United States, the United Kingdom, and other countries are summarized, along with the distribution in 1955, in the following table.

***Area Distribution of Canada's Domestic Exports,
Excluding Gold, 1955, and Projections for 1980***
(unadjusted for balance of payments purposes)

		1955	1980	
			<i>Without the "further adjustment"</i>	<i>With adjustment as in Sec. III (e)</i>
U.S. —	\$ million	2,559	7,045	7,300
	% increase		175	185
	% of total	60	68	67
U.K. —	\$ million	769	1,440	1,630
	% increase		87	112
	% of total	18	14	15
Others —	\$ million	953	1,890	1,990
	% increase		98	109
	% of total	22	18	18
Total —	\$ million	4,282	10,375	10,920
	% increase		142	155

¹⁰ It has not been possible in this study to attempt an allocation of projected exports among individual countries other than the United States and the United Kingdom. Some qualitative judgments about market developments in the main trading areas were made in Chapter 3 and little purpose would be served at this stage by attempting to go beyond those judgments.

These projections imply that sales to the United States will rise more rapidly than those to the United Kingdom or to other countries, so that there will be a further increase in the concentration of Canada's exports on the United States. According to the data in the table, Canada's domestic merchandise exports to the United States will rise by as much as 185% and will increase from 60% of the total in 1955 to about 67% in 1980. This increase in the United States share is expected to be offset by declines in the shares going both to the United Kingdom and to other overseas countries. Despite their declining shares, however, Canada's exports to the United Kingdom and to other overseas countries are each expected to double over the period 1955 to 1980.

The increase in the share of Canada's exports going to the United States results in large measure from the large share of Canada's exports of metals and minerals which are expected to be taken by that country. Considering the figures before the adjustment in Subsection III (e), moderate increases are expected in the proportion of exports going overseas in the cases of nickel, uranium and iron ore. On the other hand, the United States share is expected to rise for asbestos, aluminum, copper and other non-ferrous metals as a group, while all of the very large exports of crude petroleum and natural gas are projected as going to the United States. Thus, the United States share of this group of exports is expected to increase from 61% of the total in 1955 to 77% in 1980 (data before the adjustment suggested in Subsection III (e)). As these exports are expected to rise to more than 40% of the total to all countries, the rise in the proportion going to the United States has a significant effect upon the over-all distribution of exports.

In the case of forest products, the 1955 proportion of 80% to the United States is expected to decline to 74% in 1980, on the basis of unadjusted data. Although these exports are not expected to increase anything like as rapidly as are metals and minerals, the United States market would still remain dominant. In the case of the rapidly growing chemical exports, a small increase in the United States share — to half of the 1980 total — is anticipated. For primary iron and steel and sundry manufactures, sales to the United States are expected to continue to account for slightly more than half of total exports. Considering the broad groups in Table 3, the United States market is expected to account for less than half of Canada's exports only in the case of agricultural and animal products, where total growth is expected to be very modest. Even here, however, a small increase in the United States share, from 30% of the total in 1955 to 36% in 1980, is projected.

The increase in the share of Canada's exports going to the United States market which is anticipated is, of course, based ultimately upon the expectation of a more rapid growth in that market as suggested in Chapter 3. In particular, the inability of United States domestic sources of supply to keep pace with growing requirements will be of great importance in the

determination of the pattern of Canada's exports. The basic expectation is that United States demands for the goods which Canada sells will increase more rapidly than those in the overseas world as a whole, where it is anticipated that rates of growth will be less rapid and where, from time to time, the necessity of limiting imports to available foreign exchange will tend to hold down effective demand in certain areas.

Considering projected exports before the adjustment of Subsection III (e), the very rapid growth anticipated for metals and minerals would raise the percentage of Canada's exports to the United States, accounted for by these commodities, from 27 in 1955 to 52 in 1980. Petroleum alone is expected to account for 21% of Canada's 1980 exports to the United States. The major counterpart of this increase is an anticipated decline in the importance of forest products exports, from 48% of the total to the United States in 1955 to 29% in 1980. Another significant decline, from 11% in 1955 to 6% in 1980, is expected to occur in agricultural and animal products. Under the projection, a decline from 8% to 5% in sundry manufactures would be partially offset by an increase from 3% to 4% in chemicals.

In the case of the United Kingdom, also, a substantial increase is expected in the share of Canada's exports accounted for by metals and minerals, making this the most important group of commodities in 1980. From 36% of the total in 1955, the unadjusted projection suggests that this group will rise to 47% of the 1980 total. Unlike the case of the United States, a small increase, from 21% of the total to 24%, is expected for forest products. These increases are expected to be offset by a decline in the importance of agricultural and animal products from 38% in 1955 to 22% in 1980. As these basic materials would account for 93% of the total of unadjusted exports in 1980, as compared with 94% in 1955, it is clear that little expectation is entertained for an increase in the exports to the United Kingdom by Canada's manufacturing industries, apart from those engaged in the relatively simple processing of basic materials. There may, however, be some moderate growth in the importance of chemicals and allied products.

For other overseas countries, it is also expected that there will be an increase in the share of Canada's exports accounted for by metals and minerals, from 18% of the total in 1955 to 23% in 1980, and an increase in forest product exports, from 15% in 1955 to 19% in 1980. Here, however, it is also projected that exports of chemicals and allied products will rise from 8% in 1955 to 13% in 1980, and that sundry manufactures will grow slightly in importance, to 17% of the total in 1980. Again these changes are expected to be offset by the decline in a relative importance of agricultural and animal products, from 39% of the total in 1955 to 23% in 1980. It is of some interest that, although agricultural and animal products are expected to constitute the largest export category in 1980, exports to these other overseas countries are expected to show a much greater than average degree of diversification among major commodity groups in 1980 just as they did in 1955.

It should be stressed that the projections for the area distribution of Canada's exports in 1980 are subject to wide margins of error and the exact figures set forth must be taken as being little more than illustrative. They do, however, show the broad nature of the expectations which are entertained. The percentages in the three preceding paragraphs have all been calculated on the basis of the projections prior to the application of the adjustment to the export forecast described in Subsection III (e) above. In general, the effect of this adjustment might well be to increase the already large shares of Canada's 1980 exports which are expected to fall in the metals and minerals group.

Part B

THE OUTLOOK FOR EXPORTS BY COMMODITY

THE FRAMEWORK within which it may be expected that Canada will be exporting in the year 1980 was examined in Chapter 3 of Part A. Assuming that something like the suggested world trading environment will in fact obtain, what is likely to be the value, composition and direction of Canada's exports some 25 years hence? At the heart of the attempt to answer these questions lies an examination of the nature of and prospects for the trade, commodity by commodity. In this consideration of particular exports, past, present and likely future developments have been examined with special attention to the more dynamic elements, *i.e.*, to those items which are expected to contribute most significantly to Canada's export earnings in the future. The examination has been based on statistical and other information collected for this study, on the briefs submitted to the Commission, on drafts of the various industry studies being prepared for the Commission, and on consultations with the authors of these studies. In varying degrees, reference to other Commission studies is necessary to complete the analysis.

The usual qualifications about the approximate nature of the projections, all of which are given in multiples of \$25 million, apply throughout the following sections.¹

1. Wheat and Wheat Flour

(a) General Export Position

Data on the volume, value, and area distribution of Canada's domestic exports of wheat and wheat flour (adjusted as described in Appendix D) are shown for the periods 1926-30, 1936-39 and 1946 to July 1956 in Table 5. These data show exports reaching a peak of 414 million bushels of wheat and wheat flour equivalent in 1928, with a value of almost \$500

¹ See Section II of Chap. 4, Part A.

Table 5

CANADA'S DOMESTIC EXPORTS OF WHEAT AND WHEAT FLOUR (a)

	Total exports			Percentage distribution (by value)						
	Quantity (c) bus. 000,000	Average Value \$	Total Value \$000,000	Western Hemisphere (d)	U.K.	Rest of sterling area (e)	Cont. West. Europe and overseas territories (f)	Japan	U.S.S.R. etc. (g)	Others and unallocated
1926	297	1.46	435	4	33	3	52	4	2	2
1927	297	1.35	400	3	30	3	57	2	2	2
1928	414	1.20	498	3	27	4	58	4	2	2
1929	254	1.19	302	3	32	4	47	5	7	2
1930	242	.92	223	4	30	5	54	3	2	2
1936	255	.93	238	16	41	3	35	2	0	2
1937	140	1.30	182	14	50	7	26	1	0	3
1938	125	.82	103	3	54	8	31	0	0	3
1939	150	.67	100	9	54	7	27	0	1	2
1946	249	1.68	418	6	54	12	17	—	4	6
1947	242	1.91	462	3	61	11	19	—	2	5
1948	191	1.93	368	4	70	10	10	0	0	6
1949	254	2.10	533	7	62	13	12	0	0	6
1950	208	2.01	419	14	51	13	13	3	0	6
1951	291	1.91	555	18	36	12	23	6	0	4
1952	396	1.86	737	17	31	12	25	5	0	10
1953	340	1.97	670	10	36	15	23	8	—	8
1954	254	1.82	463	12	35	9	27	11	—	6
1955	229	1.80	413	9	40	9	24	13	1	4
1955-56 (h)	305	1.73	527	7	36	7	26	9	11	3

For footnotes, see page 135.

million or 36% of the total value of Canada's domestic export, including gold. In the next two years the volume fell to the neighbourhood of 250 million bushels and the value to \$223 million in 1930. In 1936 the volume was again about 250 million bushels and the value \$238 million. During the next three years, however, both volumes and total values were substantially lower, so that in 1937 wheat and wheat flour accounted for 15.5% of total exports. In the first two postwar years, exports again totalled in the neighbourhood of 250 million bushels but total values were in excess of \$400 million. The volume of exports rose irregularly to a postwar peak of 396 million bushels in 1952, when the value reached a record level of \$737 million or 16.5% of total exports. After 1952 the volume of exports declined sharply and average values fell moderately until, in 1955, 229 million bushels had a value of \$413 million. More recently, poor crops in Europe and substantial sales to the U.S.S.R. and Eastern Europe have meant that exports increased, so that, in the crop year ended July 31, 1956, 305 million bushels were exported with a total value of \$527 million. In 1955, however, wheat and wheat flour exports had declined to less than 9.5% of the total value of Canada's domestic exports including gold.

In the postwar period, as in the immediate prewar period, the United Kingdom has been much the most important export market for Canada's wheat and wheat flour. A similar or even greater dominance is suggested in the late 1920's by the trade data based on customs returns. According to *Trade of Canada*, 61% of Canada's exports of wheat and flour in the years 1926 to 1930 went to the United Kingdom. Almost exactly half of this amount, however, is believed to be represented by wheat which was diverted to the Continent, so that continental Western Europe, as a whole, was a significantly more important market than was the United Kingdom. For 1937 to 1939, however, the Board of Grain Commissioners' data suggest that 50% to 54% of Canada's exports went to the United Kingdom. In the postwar period, the share going to the United Kingdom rose to 70% in 1948, and, although the United Kingdom remained a more important market than continental Western Europe, the share then fell to a low of 31% in 1952. Subsequently it recovered to 40% in 1955, and in the crop year ended July 1956 it amounted to 36%.

Footnotes to Table 5

- (a) Sources are data from the D.B.S., the Bank of Canada and the Board of Grain Commissioners, as indicated in Appendix D. Total values and percentage distributions for 1936-39 and 1946 are based on the average of the results yielded by the two methods described in the Appendix.
- (b) Crop year, Augst 1955 to July 1956.
- (c) Data on wheat flour converted on the basis of four and one-half bushels of wheat = 1 barrel of 196 pounds of wheat flour.
- (d) Excludes Newfoundland, sterling area territories, overseas territories of Western European countries and U.S. dependencies.
- (e) Territories at present in the sterling area.
- (f) Continental members of the O.E.E.C. and their overseas territories. Includes wheat originally destined to the United Kingdom but diverted in the period 1926-30 and January-July, 1936.
- (g) Albania, Bulgaria, mainland China, Czechoslovakia, Estonia, Eastern Germany, Hungary, Latvia, Lithuania, Poland, Rumania, U.S.S.R., and Taiwan prior to 1953.

The significance of continental Western Europe and its overseas territories has declined very greatly since the large diversions of wheat to that market in the late 1920's. From over half of the total, the share going to the Continent (plus relatively small shipments to the overseas territories) declined to less than one-third in the immediate prewar period and dropped to 10% in 1948. Since 1951, however, approximately one-quarter of Canada's exports of wheat and wheat flour have gone to the Continent, with Germany and Belgium-Luxembourg the most important customers.

The rise in the importance of the United Kingdom has been accompanied by an increase in the share of exports going to the remainder of the sterling area. These exports reached their peak in 1953 when they amounted to \$100 million or 15% of the total. Of this amount, \$27 million went to India, \$24 million to Pakistan, \$14 million to the Union of South Africa, \$11 million to the British West Indies, and \$10 million to Ireland. In 1954 and 1955, however, the share of these territories was down to 9%, with exports to India and Pakistan declining most sharply.

Exports to the United States and other Western Hemisphere countries were 3% to 4% of the total in the late 1920's, dropped from 16% to 3% between 1936 and 1938, and rose from 3% in 1947 to 18% in 1951. Part of the relatively high level of these sales in the early 1950's is to be explained by sales of feed wheat in the United States. Nevertheless, in no postwar year did exports to the United States amount to as much as 13% of the total, the figure established in 1936. Venezuela has provided a growing market in the postwar period and exports to Brazil have been even larger in some years, although subject to more variation.

In the years 1953 to 1955, Japan has been the second most important country in purchases of Canadian wheat and wheat flour, although less important than continental Western Europe as a whole. In each of these years, exports to Japan exceeded \$50 million and in 1955 amounted to 13% of the total. In the crop year ended July 1956, however, exports to Japan were down to 9%.

In the crop year 1955-56, exports to the U.S.S.R., Poland and, to a less extent, to Czechoslovakia and Eastern Germany increased the share going to the U.S.S.R. and Eastern Europe from a negligible proportion since 1948 to 11%.

(b) *Market Outlook*

The forces which have determined Canada's exports of wheat and wheat flour and which will determine them in the future are considered in the Commission's study on agriculture to which reference should be made.² The present section is based in considerable measure on material prepared for

² W. M. Drummond and W. Mackenzie, *Progress and Prospects of Canadian Agriculture*, particularly Chap. 2, second section.

that study and on discussions with its authors. In addition, however, some general observations on the outlook for markets for agricultural exports were offered in Chapter 3 of Part A.

In the Commission's study on agriculture, it is suggested that the volume of world trade in wheat (and wheat flour) will move gradually upward from around 800 million bushels to about 950 million bushels a year. This would mean a lower volume of trade than in recent years but a level somewhat above the 1945-53 average by the end of the 25-year period under consideration. It is suggested that the share of the market obtained by Canada will be at about the 30% average established over the last 35 years. The level of wheat exports in 1980 might thus be around 255 to 285 million bushels, although in the next few years it might be lower as a result of the increased activity of Argentina and the active competition of the United States in reducing its surplus. If, however, the United States continues to reduce the amount available for export, Canada could obtain a rising share of the market so that her exports might reach or exceed 300 million bushels.

Canada can probably maintain a fairly strong export position in certain markets. Canada's main markets in the European area have been Belgium, Germany, the Netherlands and the United Kingdom. These markets are not likely to be won away by competition because of the strong quality advantage of Canadian wheat.³ In the rest of the European market, the future for Canadian wheat is less certain, although Switzerland has been buying a significant part of its total imports from Canada. In other areas, the hardness of Canadian wheat is not such a strong selling advantage because milling quality is less important. Asia and Africa together, however, may well provide a substantial and dependable market for something like 50 million bushels. In South and Central America, competition with the United States and Argentina is likely to be strongest, but some continued sales may be assumed. Canada has exported about 250 million bushels of wheat annually on the average. This level of exports can probably be about maintained and may rise over the next 25 years to as much as 300 million bushels as the level of world trade increases and the United States becomes less important in world trade.

Accepting the volume forecast of 255 to 300 million bushels in 1980 which is offered in the Commission's study on agriculture, the projection here offered is that Canada's exports of wheat and wheat flour in 1980 will have a value of about \$450 million, as compared with \$413 million in 1955 and \$527 million in the crop year ended July 1956. The average value of Canada's wheat and flour exports in 1955 was \$1.80 and in the crop year ended July 1956 it was \$1.73. The projection of \$450 million is equivalent to 250 million bushels at an average value of \$1.80 or to 300 million bushels

³ Research is continually taking place to develop new strains of wheat with the superior qualities of Canadian hard wheat but without the Canadian wheat's limitations as to where it may be grown. In December 1955, it was suggested that a superior bread wheat had been grown in the United Kingdom and that large quantities would be sown in 1956 (*The Gazette*, Montreal, December 5, 1955). If such strains could be developed, Canada's export prospects might be seriously damaged.

at \$1.50. As a fall in the price of wheat would appear to be more likely than an increase, the projection of \$450 million for exports in 1980 would seem to be a reasonable value.

Broadly, it would appear that the distribution of exports in 1980 will be not dissimilar to that in 1954 and 1955, with the possibility of some reduction in the share going to Japan. The extent to which wheat can be purchased by Japan depends upon the country's ability to sell other goods in world markets and it may be that Japan cannot continue to buy wheat and barley in world markets in the amounts which have been purchased in recent years. Nevertheless, with respect to Japan, India, South America and Africa, increasing demands for wheat can be expected. Crop yields will fluctuate and the net result may well be some increased dependence on imports by one or the other of the group.⁴ In Europe, the gradual population increase is expected to be largely offset by declining per capita consumption and higher yields per acre.

Exports to the U.S.S.R. and Eastern Europe accounted for 47% of the increase in Canada's exports of wheat and wheat flour between the calendar year 1955 and the crop year ended July 31, 1956. It need not be argued that the size of Canada's exports to these areas at the end of a 25-year period is quite uncertain.

2. *Barley, Oats and Rye*

Canada's domestic exports of barley, oats and rye have fluctuated widely in the postwar period, rising to a peak of \$231 million in 1952 and then falling to \$99 million in 1955 — this, in comparison with exports valued at \$12 million to \$14 million in the years 1937 to 1939. In both the prewar and postwar periods, barley has generally been much the most important of these three grains, and rye the least important. In most of the postwar years, the United States has been the most important purchaser of Canada's exports of barley, oats and rye, a situation similar to 1939 but unlike 1937 and 1938 when over half of Canada's exports went to the United Kingdom. In 1953 sales to the United States amounted to \$115 million. Purchases, particularly of barley, by the United Kingdom have risen in recent years, however, and in 1955 totalled \$47 million as compared with purchases by the United

⁴ Recent press reports have suggested that India was planning to export large quantities of food grains in the next five years. At the same time, however, have come reports that negotiations were being completed for the transfer of about \$400 million worth of United States surplus farm products, mainly wheat, to India. While it was reported that the United States asked India to promise that she would continue to make her normal purchases of wheat and rice in the world market, it was felt that the deal was likely to kill whatever chance Canada had of selling wheat to India. (*The Gazette*, Montreal, August 27 and 28, 1956; and *The Financial Post*, Toronto, September 1, 1956.)

Canada's Minister of Transport is reported to have said that some grain trade experts believed that in the next 20 years Japan would become as large a market for Canadian grain products as the United Kingdom had been in the past. In the meantime, however, it has been suggested that the large Japanese rice crop might mean a substantial reduction in Canada's exports of wheat to Japan. (*The Gazette*, Montreal, September 20, 1956; and *The Financial Post*, Toronto, August 25, 1956.)

States totalling \$32 million. In 1952, Japan and certain continental European countries also made heavy purchases, particularly of barley. In these cases, however, exports had been drastically reduced by 1954 and 1955.

In the crop years 1952-53 and 1953-54, Canada was the world's largest exporter of coarse grains (rye, barley, oats and corn), a position which has not been subsequently maintained. The relative importance of Canada in the postwar export picture has been associated with the disappearance of Argentina as the large exporter of coarse grains, particularly corn. Should Argentina recover its position, the coarse grain market could change radically.

It is noted in the Commission's study on agriculture that Canada's production of barley in recent years has been about three times the prewar average and, of this larger crop, about one-third has been exported as compared with about 14% before the war. Barley exports fall into three groups — for malting, for feed and for food. The market in the United States has been largely for malting barley and demand in this market is expected to increase. U.S. producers will undoubtedly attempt to meet the expanding demand but western Canadian barleys compete favourably. This market is not influenced by large yields of feed grain and, when the United States put restrictions on the amounts of coarse grains imported in 1954, the quota for barley was large enough to allow in the amount needed for malting.⁵ The market for feed barley in the United Kingdom and continental Europe, on the other hand, has typically been unstable. Barley has to compete with other feed grains including those produced under domestic agricultural programmes. If non-dollar corn should become available from Argentina, exports of Canadian barley might be considerably reduced. For the long-run future, it would seem that there will be a variable outlet for Canadian feed barley but that it will be relatively small. In the postwar period Japan has imported barley for food, as a substitute for rice. The future of this market also is quite uncertain but it might provide a variable but valuable outlet for Canadian barley.⁶

Since 1950 Canada's exports of oats have been about 12% of production as compared with about 4% before the war. Recent exports of oats have been largely to the United States, where the demand has come from dairy producers in New England who prefer Canadian grain for feeding. United States surpluses and the related agricultural programme, however, tend to reduce this market. While it seems likely that the United States will import feed grains from Canada at intermittent intervals in the future, it would also seem that no reliable market can be counted upon. In the United Kingdom and continental Europe, domestic agricultural programmes and the desire to purchase from soft currency areas would seem to mean that there is little prospect of a large market developing for Canadian oats.⁷

⁵ The quotas on oats and barley were in force from October 1, 1954 to November 30, 1955. That on rye has continued in force since April 1, 1954.

⁶ W. M. Drummond and W. Mackenzie, *loc. cit.*

⁷ *Ibid.*

In assessing the long-run prospects for Canada's major exports of coarse grains, only the market for malting barley in the United States would seem to be reasonably well assured, and even that is subject to some uncertainties. Sales to this market were down sharply in 1955 as were exports generally, with the exception of barley sales to the United Kingdom. Barley exports to the United Kingdom, however, are unlikely to be maintained at the high level of 1955. Yet coarse grain exports could probably increase were it not for the great rise in domestic feed requirements which is foreseen in the Commission's agriculture study.⁸ Local demands associated with the great increase in livestock production are expected to be such that 1980 exports are here projected at \$100 million, or almost exactly the value in 1955, and less than half the values in 1952 or 1953. The distribution of these exports is difficult to suggest. It would appear, however, that perhaps half or more of them might go to the United States, with important but variable markets for the remainder appearing in the United Kingdom, continental Europe and Japan.

3. *Other Agricultural and Vegetable Products*

In addition to wheat, wheat flour, barley, oats and rye, Canada exports substantial values of other agricultural and vegetable products. In the normal trade classification, this group excludes animal products, chemicals, fibres and wood. For present purposes, exports of alcoholic beverages and rubber products are also excluded and treated with certain other manufactures in Section 29. After these exclusions, Canada's exports of other agricultural and vegetable products were valued at \$136 million in 1954 and \$167 million in 1955, divided as shown in table on next page.

This group of commodities contains a number of items where exports have suffered considerably as a result of Canada's inability to maintain shipments to the United Kingdom. Thus the 1954 and 1955 dollar values of Canada's exports to the United Kingdom were far below those of 1937 for fresh apples; other fruits; pickles, sauces and ketchups; canned tomatoes and tomato juice; soups; and prepared cereal foods. For the last four of these items, the decline in exports to the United Kingdom was paralleled by a similar sharp decline in the value of total exports; increased exports to the United States, however, compensated in part for the decline in U.K. shipments of apples, and much more than compensated for the decline in other fruits. In these six food items, total exports to the United Kingdom fell by \$14 million, from \$17 million in 1937 to \$3 million in 1955. In five non-food items, however — oil cake and meal, vegetable oils, red clover seed, flax seed for purposes other than sowing, and unmanufactured tobacco — exports to the United Kingdom increased by \$43 million, from \$3 million in

⁸ *Ibid.* Chap. 2, first section, and Chap. 5, first section. With respect to these requirements, see also Canadian Federation of Agriculture, *Brief presented to the Royal Commission on Canada's Economic Prospects*, Ottawa, March 5, 1956, p. 44; C. W. McInnis, *Presentation to the Royal Commission on Economic Prospects on behalf of the Ontario Hog Producers' Association*, January 27, 1956, p. 2; and W. F. McLean, Canada Packers Limited, Submission to the Commission, January 27, 1956, p. 4.

1937 to \$46 million in 1955. Much the most important items in the latter group are unmanufactured tobacco and oil cake and meal, where sales to the United Kingdom account for the great bulk of Canada's exports.

*Canada's Domestic Exports of Other Agricultural
and Vegetable Products*

(thousands of Canadian dollars)

	1954	1955
Fruits.....	14,449	12,935
Vegetables.....	6,103	6,257
Other grains.....	5,974	6,646
Other farinaceous products.....	18,573	17,569
Sugar and products.....	6,378	6,196
Oil cake and oil cake meal.....	7,746	15,431
Vegetable fats and oils.....	2,544	5,530
Waste rubber.....	273	384
Seeds.....	31,694	48,745
Tobacco and manufactures.....	18,603	27,000
Hay.....	4,247	3,041
Other fodders.....	9,662	7,748
Other vegetable products.....	9,741	9,579
Total.....	135,987	167,061

Exports in 1955 went approximately one-third to the United Kingdom, one-third to the United States, and one-third to all other countries.

The United States provided well over half of Canada's export market in 1955 for such commodities as apples; other fruits; vegetables; alfalfa seed; sweet clover seed; seed potatoes; peat moss and other mosses; screenings, chaff or scorings of grain; and hay. In that year, sales of these commodities to the United States totalled \$28 million or half of exports to that country in this "other vegetable" group.

The brief presented to the Commission by the Canadian Federation of Agriculture offered some relatively pessimistic comments on the export prospects of some of the commodities covered in this section. In summary it was stated that, generally speaking, the only farm product for which Canada had a very definite international comparative advantage was hard spring wheat. Only the protection of distance enabled Canada to produce and market other products in the volume which she did. With respect to the United States, for some products such as seasonal vegetables and forage seeds Canada could compete on about even terms. Only tariffs and quota restrictions from time to time prevented a free flow of these goods across the border. More pessimism was expressed with respect to potatoes, fresh apples and other fruits. It may be noted, however, that the brief concentrated on foods and coarse grains, so that it devoted little or no attention to

Canada's two most important exports here being considered, namely, seeds and tobacco. Nor did it consider the rapidly growing oil cake and meal item.⁹

In conclusion, it would appear that only a relatively modest increase is to be expected in Canada's exports of food items covered in this section, with increased border trade perhaps accounting for much of what increase does occur. On the other hand, remarkable increases have occurred in the export of non-food items and it may be anticipated that, for at least some of these commodities, exports may continue to increase. The United States will continue to remain important in commodities which can move only short distances and in certain special items. Overseas countries, however, may be expected to continue to provide the markets for the largest amount of these exports by value. Canadian agriculture is probably much more flexible than that in most overseas countries and thus is able to take advantage of special situations, such as the recent heavy demand and high price for flax seed. Accordingly, Canada's exports of this group of commodities in 1980 is projected at \$250 million, as compared with \$136 million in 1954 and \$167 million in 1955.

4. *Live Animals and Meats*

Canada's domestic exports of live animals and meats aggregated \$72 million in 1954 and \$57 million in 1955. The composition of these exports is indicated by the following table.

Canada's Domestic Exports of Live Animals and Meats
(thousands of Canadian dollars)

	1954	1955
Cattle.....	16,602	13,388
Other live animals.....	2,653	1,937
Beef and veal, fresh, chilled and frozen....	4,538	2,721
Pork, fresh, chilled and frozen.....	17,545	15,327
Bacon and hams, shoulders and sides, cured or smoked.....	6,349	6,463
Hams, canned.....	9,932	8,787
Canned meats, n.o.p.....	7,653	1,167
Pork, pickled in barrels.....	1,099	1,252
Hams, cooked, not canned.....	2,377	2,926
Edible offal of beef, veal, pork, mutton and lamb.....	1,418	940
Other meats.....	1,835	1,824
Total.....	72,001	56,732

⁹ Canadian Federation of Agriculture, *op. cit.*, pp. 37-38, 39 and 50.

The United States has dominated the export market for these commodities in recent years. In 1955 that country took 87% of total exports, including the bulk of the cattle, other live animals, beef and veal, fresh pork, bacon and hams, canned hams and cooked hams.

The past 20 years have seen very great changes in these exports. Throughout the period, exports of cattle have gone predominantly to the United States. In 1937 and 1939 such exports were valued at about \$15 million. Somewhat the same values were re-established immediately after the war, but, with the lifting of Canadian export controls, total cattle exports rose to between \$60 and \$80 million in each of the years 1948 to 1951. The foot and mouth disease embargo meant a sharp decline in exports in 1952 and the subsequent recovery has carried such shipments only to about the pre-war value.

Exports of meats, on the other hand, went predominantly to the United Kingdom in the years immediately before the war and, in 1937-39, varied between \$34 and \$41 million. During the war, these exports rose sharply in value and the high values continued into the early postwar period. In 1948, meat exports aggregated \$133 million, of which \$77 million went to the United Kingdom. The disappearance of the United Kingdom market and the associated removal of the Canadian embargo on exports to the United States meant that exports to the latter country rose from negligible levels to \$34 million in 1948 and to \$66 million in 1951. While the value of sales to the United States has subsequently declined, shipments to that country now account for the bulk of Canada's export sales.

A further change over the period has taken place in the commodity composition of the meat trade. In 1937 bacon and hams accounted for 82% of the value of Canada's meat exports and fresh pork for 7%. Beef and veal rose in importance in the late war and early postwar periods, so that in 1951 and 1952 this item accounted for the bulk of the total. Since 1951, however, these exports have declined both absolutely and relatively. By 1955 various pork products made up 84% of Canada's total meat exports. In contrast to the prewar years, however, the most important of these commodities were fresh, chilled and frozen pork and canned hams, with bacon and hams in third place.¹⁰

The study on agriculture prepared for the Commission notes that in 1935-39 the export of pork products from Canada represented 40% of domestic consumption whereas in 1955 it was only 10%. In addition, there has been the shift from the export of Wiltshire sides to the United Kingdom to the export of special cuts to the United States. While the United Kingdom Government contracts with Denmark were to expire in October 1956, prospects were not regarded as favourable to Canadian exports over the long run.¹¹ Canada's exports to the United States have developed because the lean

¹⁰ For a brief history of export movements, see Meat Packers' Council of Canada, *A Submission to the Royal Commission on Canada's Economic Prospects*, pp. 18-19.

¹¹ See also *The Gazette*, Montreal, February 29, 1956.

hog produced in Canada provides specialty cuts which have not been available from the corn-fed hog produced in the United States. Second, the price spread between cuts makes it possible for Canadian hams and backs to sell at lower prices in the United States than do the domestic products. The hog industry in the United States is very efficient, however, and leaner type hogs are being developed. It is thus felt that over the long run the chance of a permanent export to the United States in any sizable quantity does not seem to be something which can be confidently expected. Nevertheless, a small export of specialty cuts will probably continue.¹²

Among the briefs submitted to the Commission, the Canadian Federation of Agriculture expected that by 1980 the normal exportable surplus of pork products would amount to 21% of production as compared with 10.5% in 1955. On the other hand, it recognized that a beef shortage might result in increased pork consumption and cut the export surplus to about 3% of normal production. In any event, Canada would have to take active steps to improve hog quality if the United States market was to be maintained. Prospects for exports to the United Kingdom were not regarded as favourable.¹³ The Ontario Hog Producers' Association indicated that, if the pork products going into the United States were required to meet a certain standard or were sold on a graded basis, it might give the Canadian producer a profitable market in that country for several hundred million pounds of product, as compared with about 60 million pounds in recent years.¹⁴ The brief presented by Burns and Co., Limited, saw little prospect of exports elsewhere than to the United States.¹⁵ The Meat Packers' Council of Canada noted that in the United States in recent years a distinct shift in consumer preference from pork to beef had been in evidence. The prospect of progressively keener competition and the necessity of attention to quality was referred to with respect to both the United States and the United Kingdom markets.¹⁶

The Commission's study on agriculture notes that Canadian beef has not competed easily in the world market. Before the war, exports represented about 15% of domestic consumption, whereas in 1955 they were about one-fifth of the prewar level and represented only 2% of domestic consumption. Future exports are not expected to be large. Some exports to the United States will occur at intervals as supplies available in the two countries fluctuate and consumers react to price changes. The volume is not likely, however, to be significant and, in occasional years, Canada could be a net importer of beef.¹⁷

¹² W. M. Drummond and W. Mackenzie, *op. cit.*, Chap. 2, second section. See also Chap. 5, first section.

¹³ Canadian Federation of Agriculture, *op. cit.*, pp. 28, 29-30 and 40. See also W. F. McLean, *op. cit.*, pp. 6-7.

¹⁴ C. W. McInnis, *op. cit.*, pp. 4-5.

¹⁵ Burns and Co., Limited, *Brief*, November 24, 1955, pp. 3-4.

¹⁶ Meat Packers' Council of Canada, *op. cit.*, pp. 15 and 19.

¹⁷ W. M. Drummond and W. Mackenzie, *op. cit.*, Chap. 2, second section.

The Canadian Federation of Agriculture appeared to expect that in the future Canada would have either net exports or imports of cattle and beef in its trade with the United States.¹⁸ On the other hand, the Meat Packers' Council of Canada suggested that the livestock potential in Canada was still far from being realized and more optimism was suggested with respect to the prospects of exporting cattle and beef to the United States.¹⁹

Market limitations and, perhaps even more important, domestic requirements in 1980 suggest that little or no increase is to be expected in the present level of Canada's exports of live animals and meats. The figure of \$75 million is suggested. This compares with \$72 million in 1954 and \$57 million in 1955, but is substantially below the values from 1946 to 1951.²⁰ Almost all of the projected exports are expected to go to the United States. This may appear more optimistic than is the Commission's agriculture study where only pork is expected to be exported in any quantity and this to decline as a percentage of production. Concern in that study, however, is with the net movement, whereas the present projection relates to gross exports. Some border trade may occur and, in addition, the flow of cattle to the United States for finishing is likely to continue. In addition, apart from the area of food, Canada should continue to export purebred foundation stock. There would seem, however, to be fairly general agreement that overseas markets for live animals and meats are unlikely to be of much importance.

5. Fish and Fishery Products

Canada's exports of fish and fishery products (excluding fish oils) were valued at \$130 million in 1954 and at \$125 million in 1955, as compared with \$28 million in 1937.²¹ The export statistics on fish and fishery products are complex and have been subjected to many changes as the nature of the commodities traded has altered. Subject to the difficulty of interpreting the statistics, it would appear that, out of total exports of \$125 million in 1955, \$27.7 million consisted of cod in various forms, including \$17.2 million of salt cod; \$23.0 million was salmon, including \$16.2 million of canned salmon; \$18.6 million was lobster; \$6.5 million haddock; \$6.3 million pickerel; \$5.8 million whitefish; \$4.9 million sea herring for food; and \$4.7 million flatfish other than halibut.

The United States has been Canada's most important customer for fish exports, both in the postwar period and in the years preceding the war. In 1954, when exports reached their highest total value, sales to the United States amounted to \$88 million or 68% of the total. At \$11.5 million or 9%

¹⁸ Canadian Federation of Agriculture, *op. cit.*, p. 26.

¹⁹ Meat Packers' Council of Canada, *op. cit.*, pp. 10-11 and 20.

²⁰ See Appendix C.

²¹ Prewar data, of course, exclude exports by Newfoundland which are included after March 31, 1949. In 1948 Newfoundland's exports of fishery products were valued at \$31 million, while those from Canada, as then constituted, amounted to \$85 million (D.B.S., *Review of Foreign Trade, First Half Year, 1949; and Trade of Canada*).

of the total, exports to the United Kingdom were in second place, and consisted almost entirely of canned salmon. Aggregating more than exports to the United Kingdom were sales to the islands of the Caribbean. In 1954 the dollar markets of Cuba, the Dominican Republic, Haiti and Puerto Rico purchased Canadian fish valued at \$8.3 million, with salt cod, salt pollock and pickled alewives dominating the total. Exports to the British West Indies totalled \$6.1 million, with salt cod dominating the trade. In addition, exports of \$2 million to \$3 million went to Belgium-Luxembourg and Italy and exports of more than \$1 million to New Zealand, Brazil, the Netherlands, and to Spain and Portugal considered together. Canned salmon dominated the exports to New Zealand, Belgium-Luxembourg and the Netherlands; salt cod accounted for most of the exports to Brazil, Portugal and Spain; and both commodities were important in trade with Italy. Between 1954 and 1955, exports to the United Kingdom fell from \$11.5 million to \$5.2 million or to less than the dollar value of the trade in each of the years 1937 to 1939. At the same time (from 1954 to 1955) exports to the United States rose from \$88 million to \$90 million, so that total exports to all other countries remained almost unchanged in dollar value.

In the study on Canada's fishing industry prepared for the Commission, it is noted that the fishery resources available to industry in Canada are remarkably extensive and abundant. Because of the large quantity of certain stocks in close proximity to the coast, catching costs are low enough to permit the Canadian fishing industry to compete effectively in the low-cost mass food market with such products as fillets of groundfish. On the other hand, such species as lobster and salmon have sufficient excellence of quality to permit effective competition in the quasi-luxury food markets when prices are often relatively high.²²

Exports absorb about 70% of the Canadian fishery industry's total production. The domestic market is the main outlet for such canned staple products as canned salmon, tuna, etc., and for industrial products such as meal and oil. The United States market provides the main outlets for chilled and frozen products, both staple products and such luxury products as live lobsters. The United States is also the main outlet for such so-called delicatessen items as fancy herring packs, and takes substantial quantities of cured products such as dried codfish and pickled herring. Altogether the United States market absorbs 50% of the total product of the Canadian fishing industry, which is thus vulnerable to changes in the United States tariff. In addition, that tariff encourages the importation of raw materials and hinders that of manufactured articles as indicated by the rates recently imposed on fish sticks. Exports to countries other than the United States account for 20% of Canadian production and consist mainly of cured products and canned staple products such as canned salmon. In most of the countries

²² The Department of Fisheries of Canada and the Fisheries Research Board, *The Commercial Fisheries of Canada*, Chap. 2.

where salt fish is sold, incomes and nutritional standards are low and violent changes in demand are apt to be characteristic. This instability has been aggravated by exchange restrictions and import controls, and by the reduction of the Canadian trade to reliance for supply largely on the outmoded small-boat (trap) fishery of Newfoundland, with resultant inability to provide adequate market service and compete on a quality basis. On the other hand, there is evidence of a slowly expanding demand for a fancy pack of salted codfish in North America.²³

In the submission to the Commission of the Fisheries Council of Canada, the view was put forward that Canada's basic advantages — an abundance of salmon making possible commercial canning, proximity to the United States market and the early development of a market for dried and salted cod — would continue to exert an important influence on the Canadian fishing industry. Aided by increasing populations, the long-term export market outlook for Canada's fishery products was favourable, if the industry were alert to the continuing changes in market requirements and were sufficiently flexible. Within the next 25 years, however, it was expected that the ratio of exports to total production would fall from 65% to about 50%.²⁴

Among the limiting factors to exports seen by the Fisheries Council were Canadian production costs and the ability of other nations to produce. It was not felt that expanded United States production would take up the growing market requirements, unless the United States Government initiated tariff policies which would create an artificial economic climate for such development. Strong pressure from New England was constantly being exerted to achieve this objective and, as recently as January 12, 1956, a group of New England fillet producers made formal application to the United States Tariff Commission for relief under the "escape clause". In the Caribbean, some development was taking place but climate, availability of fish and trained personnel restricted it to modest limits. On the other hand, some countries, such as Portugal and Spain which used to be major buyers of Canadian salt cod, had greatly increased their own fishing efforts. Japan, Iceland and Norway were mentioned as serious competitors in export markets. The industry felt, however, that given the proper environment through governmental policy it could meet any such future competition.²⁵

The projection of the dollar value of exports of fish and fishery products in 1980 is difficult. One uncertainty concerns the possibility of increased restrictions to entry into the United States market. On the other hand, the recent recommendation of the United States Tariff Commission for a 50% increase in the tariff on groundfish fillets was rejected by President Eisenhower. With rapid increases in population in the United States and in other

²³ Data provided by the Department of Fisheries of Canada.

²⁴ Fisheries Council of Canada, *Submission to the Royal Commission on Canada's Economic Prospects*, Ottawa, February 1956, pp. 30 and 32-35.

²⁵ *Ibid.*, pp. 35-42.

countries, the total market for fish may be expected to increase and Canadian exports could increase at the same time as supplies coming from other producers also increased. Another factor difficult to appraise is the possibility that, with total resources limited, the price of fish may continue to rise relative to the price level in general.

In arriving at an approximation to demand in 1980, the authors of the study on the fishing industry prepared for the Commission made projections on the basis of 1949-55 exports plus 43%, the median increase among the current projections of United States population. Total demand (domestic plus export) is, however, expected to increase by 60% in volume and the pressure of this demand on resources is suggested to imply higher prices.²⁶ It would seem reasonable for present purposes to suggest an increase in Canada's domestic exports of fish and fishery products from \$125 million in 1955 to about \$175 million in 1980, growing at about the same rate as is expected for United States population. While price increases may be expected to account for part of this growth, it is also possible that less valuable species will constitute a somewhat larger proportion of total exports in the future. Unless there is a sharp increase in United States protection as applied to fish, most of Canada's exports will presumably continue to go to that country.

6. Other Animal Products

Canada exports a number of other animal products in addition to live animals, meats, fish and fishery products. The value of these exports totalled \$68 million in 1954 and \$82 million in 1955, broken down as indicated in the following table.

Canada's Domestic Exports of Other Animal Products
(thousands of Canadian dollars)

	1954	1955
Furs and products.....	24,313	30,225
Hides and skins, raw.....	8,928	9,751
Leather and products.....	9,637	10,152
Cheese.....	1,544	4,054
Other milk products.....	9,080	11,961
Animal oils, fats, greases, wax.....	3,853	5,552
Eggs, shell and processed.....	3,365	1,851
Other animal products.....	7,248	8,065
Total.....	67,968	81,611

Much the largest group in the table is that covering furs and fur products, valued at \$24 million in 1954 and \$30 million in 1955. This compares with

²⁶ The Department of Fisheries of Canada and the Fisheries Research Board. *op. cit.*, Chap. 5.

a peak value of \$32 million in 1946. Most important among the furs are undressed mink skins, valued at \$16 million in 1954 and \$17 million in 1955. Of these exports, over 90% went to the United States. Similarly the United States took most of Canada's exports of other furs and manufactures. Mink skins have become much more important since 1937, and, with this shift, the United States market has become much more important. Exports to the United Kingdom were 61% of the total in 1937, with over half consisting of fox skins. In 1954 the U.K. share was 17% and in 1955 it was 16%.

Hides, skins, leather and leather products aggregated \$19 million in 1954 and \$20 million in 1955, a lower value of exports than was achieved in 1928 or in the years 1947 to 1951. In the hides and skins group, especially in the important cattle hides and skins, the United States is a relatively less important market than it was in 1928 or 1937. The United Kingdom, on the other hand, has increased in importance. Exports of important leathers to the United Kingdom, however, have declined since 1937.

Cheese and other milk products have recently had a smaller value than they did in the late 1920's. Cheese exports, the more important of the two items in the prewar period, were valued at \$25 million in 1926 and in 1928. In 1937 they had a value of \$13 million and during the war they rose to a peak of \$28 million in 1945. Since the war they have fallen to the low levels of \$1.5 million in 1954 and \$4 million in 1955. Exports of other milk products were valued at \$16 million in 1926, at \$5 million in 1937, at \$18 million in 1948, at \$9 million in 1954 and at \$12 million in 1955. The great bulk of Canada's cheese exports go to the United Kingdom and total exports have fluctuated with the amount taken by that country. Most important in explaining the relative increase in exports of other milk products in comparison with the immediate prewar period are exports of milk powder which were valued at \$7.1 million in 1955, with \$4.9 million of the total going to Venezuela.

Exports of eggs have fluctuated widely. In the prewar period they were negligible but, with heavy shipments to the United Kingdom during the war, rose to a peak value of \$44 million in 1945. Shipments continued heavy in the immediate postwar period and in 1948 amounted to \$39 million of which \$37 million went to the United Kingdom. In 1954 and 1955, however, exports were valued at \$3 million and \$2 million respectively, with no shipments whatsoever to the United Kingdom. The United States and Venezuela have taken most of Canada's exports of eggs in recent years.

The value of Canada's fur production varies widely from year to year. In the 1945-46 season, the total value was \$44 million. By 1953-54 it had fallen to \$19 million, but in 1954-55 it had risen again to \$31 million. Of the amount produced in 1954-55, 43% came from fur farms and 57% was of wildlife origin. Mink accounted for most of the fur farm production, while muskrat and beaver were more important than mink in the furs of wildlife

origin. Concerning itself with furs of wildlife origin, the brief to the Commission by the Canadian Conservation Association stated that, inasmuch as furs were largely a luxury item depending for their use upon uncontrollable vagaries and fashion, it was doubtful that stability would be obtained until the ratio between demand and supply had changed quite radically. This could take place with increasing population. Farm raised furs and synthetic fur substitutes could be provided on a more flexible basis than wild-caught furs and it seemed unlikely that the gross value of the wild-caught raw furs entering the fur trade from Canada would increase beyond the \$20 million level of 1951. This compared with \$37 million in 1946 and with \$13 million in 1954-55. On the other hand, the production of Canadian fur farms could probably be expanded considerably. The future role of Russian competition, however, and of substitution by synthetics make projection difficult.²⁷

The brief to the Commission by the Canadian Federation of Agriculture offered some comments on export prospects in eggs and dairy products. It stated that, with the exception of the war years, Canadian egg production had been closely geared to domestic requirements. For the years 1950 to 1954, exports amounted to 2.9% of production. An exportable surplus of 2% of normal production was assumed for 1980 and an increase of 63% in total production was projected from 1954 to 1980. Thus it would appear that exports were not expected to increase much above the 1950-54 level when they varied between \$3 million and \$6 million. As regards dairy products, it was stated that Canada cannot successfully compete on world markets and it was assumed that there would be no exports or imports of dairy products in 1980.²⁸

There would seem to be little basis for confidence in making a projection of Canada's exports of the miscellaneous animal products covered in this section. While it is easy to be pessimistic about these products, Canada will continue to be an important producer of farm and other animal products and the strength of exports of milk powder would suggest some degree of optimism for the future. Declines may be suffered in some commodities exported but there may well be increases in others. Thus it is suggested that exports in 1980 may aggregate \$125 million. This would be 84% above the value achieved in 1954 and 53% above the value in 1955.

7. *Fibres, Excluding Synthetic Fibres*

Canada's domestic exports of fibres, textiles and products amounted to \$21 million in 1954 and to \$23 million in 1955. Most of these exports, however, can be regarded as manufactures and are covered in Section 29; exports of natural fibres in the group were only \$1.7 million in 1954 and \$1.5 million in 1955, largely raw wool. It is not considered that these exports will be

²⁷ D.B.S., *Fur Production, Season 1954-1955*; The Canadian Conservation Association, *The Wildlife Resource in Canada*, a Brief presented to the Royal Commission on Canada's Economic Prospects, pp. 18-20; and *The Financial Post*, Toronto, July 7, 1956.

²⁸ Canadian Federation of Agriculture, *op. cit.*, pp. 30, 32, 36, 40 and 41.

important enough in the future to have a significant effect upon total exports. Accordingly no projection is deemed necessary for these items.

8. *Lumber*

(a) *General Export Position*

Since 1952 Canada's third most important export has been lumber, or planks and boards as referred to in the trade statistics. In the years 1952 to 1954, domestic exports of lumber averaged 3.6 billion board feet with a total value averaging \$301 million. In 1955 there was a sharp increase in volume to 4.6 billion board feet and in value to \$385 million or 9% of total domestic exports including gold.²⁹

Since 1948 the United States has taken over half of Canada's lumber exports. In 1955 exports to the United States amounted to 71% of the total value, while the United Kingdom took 18%, the Union of South Africa 3.2%, and Australia 3.1%. Except in 1947 when France and the Netherlands together accounted for over 6% of Canadian export sales, these four countries have dominated the export picture in the postwar period. Similar dominance can be seen in the immediate prewar period when, however, the United Kingdom took over half of Canada's exports.

The dominant position in Canada's lumber exports has been occupied by softwoods which accounted for 88% of the total value in 1926, 87% in 1937 and 95% in 1955. The most valuable species in 1955 were Douglas fir, spruce, hemlock and cedar, in that order. The volume of exports of Douglas fir rose by 35% from 1926 to 1937, and by 142% from 1937 to 1955. Exports of spruce declined in volume from 1926-27 to 1937-38 but, since the immediate prewar period, have about tripled and now considerably exceed the 1926-27 levels. The United States is the most important market for every type of lumber exported, except for the relatively unimportant miscellaneous softwoods. The United Kingdom, however, in 1955 purchased almost as large values of hemlock and took significant quantities of Douglas fir and spruce. Douglas fir accounts for most of the exports to Australia and the Union of South Africa.

(b) *Canadian Production*

The volume of lumber produced in Canada (including planks and boards and also square timber) showed a general declining trend from the end of the first decade of this century until the 1930's. Not until 1941 did the volume of production exceed the level of 4.9 billion board feet achieved in 1911. Since the war, however, production has risen sharply and in 1954 was 7.2 billion board feet. In 1955, it would appear to have risen to about 7.8 billion feet. From 1926 to 1954 Canada exported approximately one-half of the volume

²⁹ In the first 10 months of 1956, exports were down to \$281 million from \$332 million in the same period in 1955. Almost \$27 million of this decline occurred in exports to the United Kingdom but exports were also lower to the United States, the Union of South Africa, and Australia.

of lumber produced. Percentages have fluctuated sharply, between 37 and 58, with some evidence that exports are taking a declining share of the total output. Between 1953 and 1954, however, exports rose from 46% to 56% of production.³⁰

(c) *Canada's Place in World Production and Trade*

Data published by the Food and Agriculture Organization for 1954 show Canada as the third most important producer of lumber with 7.4% of the world total. In the world picture, Canadian production was considerably exceeded by that of the United States and the U.S.S.R., and was followed by Japan, Sweden and Western Germany. The same data show Canada as much the most important exporter of lumber with 35% of total exports, followed by Sweden with 15%, and Finland and Austria with about 12% each. For softwood lumber, the Canadian percentages were somewhat higher — 8.8% of total production and 38% of total exports. Even in the less important field of hardwood lumber, Canada was the sixth producer (2.6%) and second to Yugoslavia among exporters (9.7%).³¹

Lumber imports are important to the United States but, according to the F.A.O. data, amounted in 1954 only to 8.9% of apparent consumption of softwood lumber while exports were 1.7% of apparent consumption. Of the United States imports, Canada supplied over 96% and Mexico 2.6%. In the field of hardwood lumber, United States imports were 2.9% of apparent consumption in 1954, with 46% of the total coming from Canada and 29% from the Philippine Republic.³²

In the case of the United Kingdom, 57% of apparent consumption of hardwood lumber was produced domestically in 1954, but imports supplied over 95% of the softwood which was consumed.³³ On the basis of United Kingdom trade data, Canada was the most important supplier of softwood lumber in the years 1951, 1952 and 1954. In 1955 imports from Canada were exceeded by those from Sweden; in 1953 by those from Sweden and Finland; and in 1950 by those from the U.S.S.R. and, by volume, from Finland.

United Kingdom imports of softwood lumber from Canada have fluctuated widely in recent years, both in absolute amount and as a percentage of total United Kingdom imports. Nevertheless, although the total volume of United Kingdom imports has been running lower than the 1937–38 average, the volume received from Canada has, except in 1953, been higher. The fluctuations in United Kingdom imports suggest that the placing of the

³⁰ D.B.S., *The Lumber Industry, 1954; Production, Shipments and Stocks on Hand of Sawmills in British Columbia*, December 1955; and *Production, Shipments and Stocks on Hand of Sawmills East of the Rockies*, December 1955.

³¹ Food and Agriculture Organization of the United Nations, *Yearbook of Forest Products Statistics, 1955*, Rome, Italy, pp. 56–64. Data on total production and trade are for coniferous and broadleaved sawnwood, including boxboards; the separate softwood and hardwood data exclude boxboards.

³² *Ibid.*, pp. 59, 62, 68 and 72. Data on imports by country of origin include boxboards.

³³ *Ibid.*, pp. 59 and 62.

trade under the U.K. open individual licence system in 1953 had little apparent effect on Canada's exports. These fell sharply from 1952 to 1953 and have subsequently recovered only part of the loss. This situation suggests the strength of the Canadian export position even in the face of discriminatory restrictions in consuming countries and that, even with restrictions, the United Kingdom found it desirable to purchase substantial quantities of lumber from Canada.

(d) *Market Outlook*

With regard to markets for Canadian lumber exports, the outlook for the future would appear to be bright, with strong demand and prices rising relatively to the general price level. Indeed, three studies which have appeared in the United States during the past five years each appear to yield the conclusions that prices will be higher and that the basic limitation to Canada's exports will not be markets but Canada's ability to supply.

The Paley Report contained a mass of scattered opinion as to the future for lumber.³⁴ A study prepared for the Report by the Forest Service of the United States Department of Agriculture suggested a substantial free world deficit in industrial wood in the period 1970-79. For the various areas examined, only Canada was expected to be a net exporter and Canadian exports of 33 million cubic meters (roundwood) would fall far short of the net total deficit in all areas of 194 million cubic meters. Free flow of trade throughout the world would change the outlook. But, even under the most favourable world conditions, the volume of wood exports from the U.S.S.R. was not expected to exceed some 50 million cubic meters or nearly five times the prewar peak. Other countries in the Soviet sphere would not be in a position to export more than minor quantities, so that the gap between estimated free world requirements and output would remain far from closed.³⁵

In its more detailed consideration of the United States, the Paley Report expected a 10% increase in both timber and sawlog requirements between the peak established in 1950 and 1975.³⁶ This was based upon the general assumption throughout the Report of the continuation of 1950 price relationships. Despite indications to the contrary which are contained in the Report, no allowance for net lumber imports was made in estimating the situation in 1975. Nevertheless, starting from a 1950 situation where sawlog produc-

³⁴ *Resources for Freedom*, a Report to the President by the President's Materials Policy Commission, June 1952, U.S. Government Printing Office, Washington, D.C., five volumes, hereafter cited as *Paley Report*.

³⁵ *Paley Report*, Vol. V, pp. 47-62.

It should be noted, however, that press reports appear from time to time indicating strong potential Russian competition (see footnote 99, Chap. 3).

³⁶ Projections for the year 1975 in the *Paley Report* "should not be regarded as applying to that literal point in time, but rather considered as a plausible shape of things in the decade 1970-1980" (Vol. I, p. 2, footnote).

tion was only 93% of use and where the United States was using up its inventory of sawtimber 40% faster than growth, United States self-sufficiency in 1975 would only be possible on a stable basis with remarkable achievements in forest management and fire, insect and disease control. Indeed it was estimated that, unless current trends were modified, the 1975 drain might exceed the growth of sawtimber by over 50%.

The key to the Report's estimate of no net imports is perhaps contained in the statement that "considering the world shortage of softwood timber, it would not be wise to count on any net import of lumber in 1975".³⁷ With respect to supplies from Canada, it was noted that Canada's own needs were growing and that other countries would also have to depend upon this source of softwood imports. At the same time, however, it was not expected that the vast forest reserves outside North America and Europe would result in serious competition for Canadian exports. Except for Canada and Alaska, the free world's undeveloped forests were chiefly tropical hardwoods and about one-half of the productive areas of surplus countries were in economically inaccessible areas. Further, tropical hardwoods could not readily replace softwoods for general utility and construction purposes.

Studies issued subsequent to the Paley Report yield the same broad conclusions. A study by Stanford Research Institute foresaw a major expansion for most activities where lumber was consumed.³⁸ But the costs of producing lumber would probably increase, so that lumber prices would rise relatively to competing materials. Imports would not be sufficient to prevent this increase in price, especially as the desirable softwoods constituted only about one-third of the total supply in productive forest areas of the world. Most future imports into the United States were expected to come from Canada, largely from British Columbia.

In summary, the Stanford Study expected that United States consumption of lumber would be unchanged between 1952 and 1960 and would then rise by 1975 by about 10%. The increase, however, would bring 1975 consumption to only about 4% above the consumption level in the year 1950. As regards net imports, the expectation was for a decline between 1952 and 1965 and, after that, for an increase which in 1975 would involve volumes at some 20% above the 1952 level. This pattern of imports, however, depended on the ability of external sources (chiefly Canada) to supply lumber, on the development of United States production, and on the re-use of salvaged lumber. The sharp increase in the re-use of lumber which was incorporated in the estimate, however, was not based upon reliable data but was given as something which "appears reasonable".³⁹

³⁷ *Ibid.*, Vol. V, p. 36.

³⁸ *America's Demand for Wood, 1929-1975, Summary of a Report by Stanford Research Institute*, Stanford, California, to Weyerhaeuser Timber Company, Tacoma, Washington, 1954.

³⁹ The summary of the Stanford Study, to which reference is made here, only dealt with U.S. net imports of lumber, which were shown as increasing from 1.8 billion board feet in 1952 to 2.2 billion board feet in 1975.

More recently a United States Forest Service Study known as *Timber Resource Review* has appeared in draft form.⁴⁰ In considering future United States timber requirements, the Review noted that potential demand higher than prospective supply indicated a probability of upward movement of timber prices. Two sets of projections were made for timber requirements. The lower set, derived from past trends, reflected a relative decrease in demand for timber products and a continued increase in the real price. Upper level estimates were based on the assumption that industrial timber products would occupy the same position relative to the consumption of all physical-structure materials as they did in 1952. Under the lower level estimate, the consumption of lumber would rise from 41.5 billion board feet in 1952 to 46.0 billion in 1975. This estimate was close to that of the Paley Report and somewhat above that of the Stanford Study.

Lower level demand might be reasonably well met for some time. But, although the projected inventory of sawtimber would be slightly in excess of the needed inventory in the year 2000, the projected growth would be about 16% below needed growth, and growth and cut would be diverging rather sharply. According to a chart presented, the assumed cut of sawtimber would fall below annual growth in about 1965 but would begin to exceed annual growth by about 1980. In addition, there would be important deficits in eastern softwoods and western species and surpluses in eastern hardwoods. As regards the upper level of demand, there would seem to be little prospect that it could be maintained throughout the period under consideration. At no time would the annual growth be as great as the assumed cut and, by 1975, the two curves would begin to diverge sharply.

A number of factors could affect this outlook. On the one hand, timber supplies could be larger, for example, through the use of more intensive forestry than was assumed. On the other hand, the future demand for forest products might have been underestimated. Among the factors which might increase timber supplies, it was stated that imports from Canada might be greater than had been assumed. In this connection, allowance was made for a conservative increase in imports, chiefly from Canada, from 1.15 billion cubic feet of roundwood in 1952 to 1.25 in 1975 and 1.35 in the year 2000. This, however, applied to all timber — for lumber, it was anticipated that net imports would decline from 1.75 billion board feet in 1952 to 1 billion feet in 1975 and 1980.⁴¹ The outlook for increased imports from Canada of softwood lumber of quality grade was regarded as not encouraging over the long run. At current rates of cutting there appeared to be a 25- to 50-year supply of old growth Douglas fir which was perhaps the most important source of high quality lumber in Canada.

⁴⁰ Except as noted, this discussion is based on Edward C. Kraft's *Chapter I, Timber Resources for America's Future, A Summary of the Timber Resource Review* (Preliminary Review Draft Subject to Revision), U.S. Department of Agriculture, Forest Service, September 1955.

⁴¹ *Timber Resource Review*, Chap. VI (Preliminary Draft), p. 50.

The chapter on lumber and allied products in the Commission's study on the forest industry considers in some detail past developments in export markets for Canadian lumber and the prospects for exports in the future.⁴² On prospects for exports to the United States, the study assumes a 25% to 35% increase in the real price of lumber between 1952-54 and 1980.⁴³ It is noted that the complete Stanford Study estimated gross imports of 4.3 billion board feet in 1975, as compared to 2.5 billion feet in 1952. *Timber Resource Review*, on the other hand, estimated net imports in 1975 at 1.0 billion board feet compared to 1.75 billion feet in 1952. The tendency of United States studies to limit their projections of imports on the basis of their views on availability has been indicated above and, in the study prepared for the Commission, it is suggested that if the resources are available, Canada might in the future supply as much as 10% of United States lumber requirements as compared with 6.3% from 1952 to 1954. On the basis of the Stanford and Forest Service studies, it is suggested that exports of Canadian lumber to the United States in 1980 could be between 4.5 and 5.0 billion board feet.

Lumber consumption in the United Kingdom in the past few years has been at a lower level than in the prewar period. It is expected that consumption and imports will increase gradually over the years and that by 1980 imports will have regained their prewar level of about 4.0 billion board feet. Canada is expected to about maintain its present share of this market and thus to export about 1.0 billion feet to the United Kingdom, as compared with 0.78 billion feet from 1952 to 1954.

Exports to other countries are expected to about maintain their present level of some 300 million board feet per annum.

In summary, it is suggested then that the Canadian lumber industry could export 5.8 to 6.3 billion board feet of lumber in 1980, as compared with an average of 3,589 million board feet in 1952-54.⁴⁴ As regards the value of these exports, the study notes that the average value of exports for the period 1952 to 1954 was \$70.10 per thousand board feet, in 1949 dollars. A 30% increase in price would bring this value to \$91 per thousand by 1980. Total revenue in 1949 dollars in 1980 would thus be \$528 million based on exports of 5.8 billion board feet and \$573 million based on 6.3 billion feet. This compares with average revenues of \$251 million (1949 dollars) for the period 1952 to 1954. Between 1949 and 1955, however, the unit value of exports of lumber (planks and boards) rose by 13.8%. If this increase is applied to the figures in the study on the forest industries, it may be suggested that, at

⁴² John Davis, A. L. Best, P. E. Lachance, S. L. Pringle, J. M. Smith, D. A. Wilson, *The Outlook for the Canadian Forest Industries*, Chap. 4.

⁴³ This is in line with *Timber Resource Review* where it was suggested that, under the lower-level estimates of demand, real lumber prices would probably increase by not less than 25% to 30% between 1952 and 1975 (Chap. VI, p. 40).

⁴⁴ In addition to lumber as the term is used in the present section, *i.e.*, planks and boards, these projections also include the relatively unimportant square timber and railroad ties, exports of which in 1955 were valued at \$3 million. In the period 1952 to 1954, exports of planks and boards averaged 3,575 million board feet as compared with exports of lumber as defined in the Commission's study on the forest industries of 3,589 million board feet.

the 1955 general level of prices, its projections are for lumber exports in 1980 of \$600 to \$650 million.

The final question concerns Canada's ability to supply exports of this magnitude. In the chapter on the lumber and allied products it is estimated that Canada's consumption of lumber in 1980 will be 5.85 billion board feet. If this is added to exports of 5.8 to 6.3 billion feet, it will be seen that requirements in 1980 would be 11.6 to 12.1 billion board feet of lumber at increased prices. This compares with Canadian production of about 7.8 billion feet in 1955, or it involves an increase of about one-half. There would seem to be no difficulty with the notion that Canada could export at least the volume of lumber which is suggested, provided that it was available. The problem is whether or not there can be such an increase in Canadian lumber supplies. The Commission's study on the forest industries concludes that resources will be large enough to supply both domestic and export needs in the magnitudes suggested.⁴⁵ Some uncertainty may be felt regarding the magnitude of Canadian sawtimber resources. There may exist the possibility of technological development, such as the further production of glued-up panels which involve the cutting of short clear sections from low-grade lumber and gluing the pieces into large panels from which wide boards are then sawn.⁴⁶ Such developments, however, would enable increased production in the United States and other countries as well as in Canada.

In conclusion, subject to some qualification about Canada's sawtimber resources, it is here suggested that exports of lumber in 1980 might be valued at \$600 million, the lower level projected in the Commission's study on the forest industries. This would be about 56% above the value in 1955 and almost double the average value in the years 1952 to 1954. The projection involves an increase in both quantity and price. The distribution of exports as suggested in the study on the forest industries would seem appropriate.

9. Newsprint

(a) General Export Position

In four of the first ten postwar years — 1948, 1950, 1954 and 1955 — newsprint has been Canada's most important export, while in each of the others it has been second to wheat and wheat flour. Whereas wheat and flour exports have fluctuated widely, newsprint has increased steadily in value and volume since the war, even when total exports were falling. In 1955 Canada's domestic exports of newsprint amounted to 5,763,000 short tons valued at \$666 million or 15% of total domestic exports including gold.⁴⁷

⁴⁵ John Davis *et al.*, *op. cit.*, Chap. 8.

⁴⁶ It has been reported that the Abitibi Pulp and Paper Company would open a synthetic lumber plant in 1956, using small chips of poplar to produce lumber in sheets like plywood (*The Gazette*, Montreal, May 10, 1956).

⁴⁷ In the first ten months of 1956, exports were valued at \$590 million as compared with \$549 million in the same period in 1955.

At the same time, newsprint exports to the United States accounted for 21% of total domestic merchandise exports to that country plus new gold production available for export.

The pre-depression peak in Canada's exports of newsprint occurred in 1929 when exports of 2.5 million tons were valued at \$149 million. Exports declined during the depression but, by 1937, the volume had risen to almost 3.5 million tons, although the value was only \$126 million. After the war total exports rose steadily to 5.8 million tons valued at \$666 million in 1955.⁴⁸ In the first five years of the postwar period, the share going to the United States increased, from 86.1% in 1946 to 95.7% in 1950. Subsequently, sterling area, continental European and Latin American sales have increased relatively, so that exports to the United States were 87.2% of the 1955 total. This, however, was still above the United States share of 79.9% to 83.9% in 1937-39 and slightly above the 86.6% in 1929. Other important export markets in 1955 included the United Kingdom which took 5% of the total volume, Australia which took 1.3%, and Mexico, the Union of South Africa, New Zealand, France and Brazil, each of which took less than 1%.

(b) *Market Outlook*

The production and export of Canadian newsprint and Canada's position in the world picture are all treated in the brief submitted to the Commission by the Canadian Pulp and Paper Association.⁴⁹ Further, the Association Brief presents a carefully worked out forecast of exports in 1980. The following paragraphs consider the Association forecast and offer some comments upon it.⁵⁰

The Association Brief forecast that by 1980 Canada's exports of newsprint to the United States would rise to 7,620,000 tons or 52% above recorded exports in 1955. Exports to all other countries in 1980 were forecast at 3,830,000 tons or 421% above experience in 1955. Using average export values ruling in the first half of 1956, this would mean that exports to the United States would grow from \$578 million in 1955 to \$899 million in 1980 and that exports to overseas countries would grow from \$88 million to \$469 million.⁵¹ Total exports, therefore, would rise from \$666 million in 1955

⁴⁸ The inclusion of shipments from Newfoundland in Canadian export data after March 31, 1949, has affected the exports shown for newsprint and, to a less extent for other forest products. In 1948, Newfoundland's exports of newsprint were valued at \$26 million and other forest products at \$6 million (D.B.S., *Review of Foreign Trade, First Half Year, 1949*).

⁴⁹ Canadian Pulp and Paper Association, *Submission to Royal Commission on Canada's Economic Prospects*, Montreal, January 1956, hereafter referred to as the *Association Brief*. (Page references are to the printed version.)

⁵⁰ Reference is to the *Association Brief* rather than to the similar material in Chap. 5 of the Commission's study *The Outlook for the Canadian Forest Industries* (by John Davis, A. L. Best, P. E. Lachance, S. L. Pringle, J. M. Smith and D. A. Wilson) as the latter was not available in final form when the present study was finalized.

⁵¹ The Stanford Research Institute study cited in the previous section indicated that pulp and paper prices were not expected to rise relative to other prices. Price increases announced late in 1955 became effective between November 1, 1955 and January 1, 1956.

No account has been taken of the further increase in the New York price of US \$ 4 per ton announced by some companies in January 1957.

to \$1,368 million in 1980. As in the Association Brief and the Commission's study on Canadian forest industries, it is here assumed that Canadian production can supply these exports plus the demands of the Canadian market.⁵²

Looking at the United States, the Pulp and Paper Association's projection involved consumption in 1975 considerably above the Paley Report and the study by Stanford Research Institute. It was, however, more in line with the more recent forecast of the United States Forest Service in *Timber Resource Review*. Further, the Association's forecast was in line for the years 1960 and 1965 with shorter-run projections by the American Newspaper Publishers' Association and the Economist Intelligence Unit. Finally, as stated in the brief, the method used by the Association would appear to result in a conservative forecast.⁵³

The Paley and Stanford forecasts of United States production are outdated by increases in United States capacity which have taken place recently and which are planned for the next four years. This might result in the creation of capacity of 2.1 million tons by 1960.⁵⁴ Beyond 1960, there arise questions of further expansion from southern pine, expansion from hardwoods and the effects of governmental policy.⁵⁵ The submission by the Pulp and Paper Association examined these factors and concluded that it might be assumed that the United States and Canadian shares of the United States market would remain at the 1960 proportions.⁵⁶

Assuming relatively small United States exports and relatively small imports from overseas, the Association Brief arrived at United States imports from Canada of 6.9 million tons in 1975 and 7.6 million tons in 1980.⁵⁷ For 1975 this was about the level of imports expected by *Timber Resource Review* and about that implied by the Stanford Study on the basis of lower United States consumption and production figures. It was, however, somewhat above the Paley figure.

The projections of overseas demand by regions showed European consumption with the slowest rate of increase — 64% between 1955 and 1980 as compared with 242% for the rest of the overseas world. But Europe would still remain the largest consuming area outside the United States, with 38% of the overseas total.⁵⁸ A rate of growth in overseas production slower than in consumption, together with a relatively small change in overseas trade with the United States, resulted in the projected quintupling of

⁵² *Association Brief*, pp. 53 and 82; D.B.S., *Trade of Canada*; and John Davis *et al.*, *op. cit.*, Chap. 8.

⁵³ *Association Brief*, p. 33.

⁵⁴ *Ibid.*, p. 48.

⁵⁵ On the matter of competition from U.S. southern pine and northeastern hardwoods, see *Statement to the Royal Commission on Canada's Economic Prospects* by Vernon E. Johnson, President, Canadian International Paper Company, pp. 8–13.

⁵⁶ *Association Brief*, pp. 48–49.

⁵⁷ *Ibid.*, p. 48.

⁵⁸ *Ibid.*, p. 42.

Canadian overseas exports.⁵⁹ Basic to this result were the expectations that current relatively low levels of newsprint use would not persist and that available forest and capital resources of the rest of the world would not be able to provide for the projected growth of consumption.⁶⁰

Projections for Canada's overseas exports offered in the Pulp and Paper Association Brief were described as being on the basis of "physical need", without specific reference to the question of ability to buy.⁶¹ In addition to the problem of foreign exchange availabilities, there arise questions of protectionism, economic isolation and nationalism. The latter factors were dealt with on the basis of an assumption that expanding newsprint imports would form part of a general expansion of world trade contributing to economic development. Newsprint production, however, is being expanded abroad. Not only is it included in plans for economic development, with suggestions that consumers be forced to mix high-cost domestic supplies with imports, but new facilities are also being established in Europe and in New Zealand.⁶² To the outsider there may arise, in addition, the question of the possibility of the use of tropical hardwoods removing any general problem of availability of forest resources. This question arises particularly in the light of developments which have permitted the use of hardwoods for the production of pulp and paper in the United States.⁶³ Also there is the recent report that *The Times* of London is no longer using newsprint. These factors may give rise to doubts that the Pulp and Paper Association's target can be achieved with respect to overseas countries, particularly if continued balance of payments difficulties are expected. Indeed, the use of tropical hardwoods by potential overseas exporters could also affect Canadian exports to the United States.

As has been noted, the Association's projections imply that the value of Canada's overseas newsprint exports would more than quintuple between 1955 and 1980. In the five years following 1950, in which year overseas exports were severely depressed, Canada's exports abroad almost quadrupled. For the future, however, the projected increase would be a much larger absolute magnitude — \$381 million as opposed to \$65 million. Will overseas countries as a group be able and willing to pay out this much more in Canadian dollars for a single commodity, especially in the light of the continued possibility of restrictions on the use of newsprint and in the face of expanded overseas production? While doubts may be expressed,⁶⁴ it may

⁵⁹ In a subsequent section (on p. 76) the *Association Brief* stated that over one million tons of the projected increase in overseas exports (3.1 million tons) would go to Europe.

⁶⁰ *Ibid.*, pp. 49–53.

⁶¹ *Ibid.*, p. 52.

⁶² See Newsprint Association of Canada, *Newsprint Data: 1955*, Montreal, November 1955, pp. 22–23.

⁶³ See *Association Brief*, pp. 46 and 86. The question of the use of tropical hardwoods, bagasse, straw, etc., is considered further on pp. 49–52 of *Submission to the Royal Commission on Canada's Economic Prospects* by Canadian Pulp and Paper Association (Western Division), prepared by British Columbia Research Council, Vancouver, January 10, 1956.

⁶⁴ See Canadian Pulp and Paper Association (Western Division), *op. cit.*, pp. 53–54.

be noted that North American exports in 1955 were only moderately above those in the period 1935 to 1937.⁶⁵

It may be suggested that, if the overseas world is viewed as a whole, \$381 million more for Canadian newsprint is not an insuperable amount in the light of expected trade developments. The value of world trade will rise between 1955 and 1980 and with it the value of trade between Canada and overseas countries. While the latter increase will presumably not be fivefold at a constant general level of prices, the above average increase in the case of newsprint will be offset by less than average increases for other commodities, such as wheat and wheat flour and automobiles.⁶⁶ This, however, masks the fact that the balance of payments situations of different overseas countries will vary greatly. Some will almost certainly be exercising restraints on their dollar purchases, even if this is through controls other than those directly affecting imports. Further, other countries, even if they do not have balance of payments problems, can be expected to be stimulating the domestic production of newsprint through various devices. Consequently, some of the constituents of the \$469 million of overseas newsprint exports may not be realizable and it may be desirable to use a lower figure in forecasting Canada's exports.

It, therefore, would seem to be appropriate to reduce the figure for overseas shipments of newsprint from \$469 million to \$350 million in order to take account of the possibilities which have been suggested. For the United States, the figure of about \$900 million or 56% above the 1955 value is retained. This would mean total exports in 1980 of \$1,250 million, somewhat less than double the \$666 million in 1955.

10. Wood Pulp

(a) General Export Position

In recent years wood pulp has ranked fourth among Canada's exports, exceeded only by newsprint, wheat and flour, and lumber. At \$297 million in 1955, domestic exports of wood pulp amounted to 6.7% of total domestic exports including gold.

In 1926 Canada exported over one million short tons of wood pulp valued at \$52 million, a volume and value of exports not achieved again until 1940. After the war, pulp exports increased erratically up to 1951 when there occurred a substantial increase in the volume of exports and an even greater increase in average values. Thus exports of 1.9 million tons of chemical pulp were valued at \$333 million and 323,000 tons of mechanical pulp or groundwood at \$27 million. Total exports, including screenings, were 2,243,000 tons or \$365 million.

⁶⁵ Newsprint Association of Canada, *op. cit.*, p. 4.

⁶⁶ The reasonableness of the suggested increase in Canada's total overseas exports is examined in Chap. 4 of Part A of this study.

Subsequently, average values have been well below the 1951 level and volumes also declined initially. The volume of exports of chemical pulp, however, exceeded the 1951 level in 1954 and rose further in 1955 to 2,051,000 tons. Mechanical pulp, on the other hand, has remained below the 1951 volume and in 1955 amounted to 262,000 tons. Thus, in 1955 total wood pulp exports were 2,366,000 tons, an all-time high, although the value of \$297 million was considerably below the 1951 peak. The growth in the volume of exports between 1926 and 1955 has been entirely the result of the 229% increase in chemical pulp. Groundwood exports have declined absolutely from 38% of total pulp exports to 11%. By value, groundwood exports in 1955 were \$18 million or 6% of the total.

In addition to the \$18 million of groundwood, \$5.9 million of pulp n.o.p. and \$366,000 of screenings, there were \$273 million of exports of chemical pulp in 1955 — 92% of the total value. The largest item in this group, both by volume and by value, consisted of 670,000 tons of bleached sulphate or kraft pulp valued at \$91 million. This pulp is used to manufacture white printing, tissue, tag, envelope and other papers and products where strength is essential. Next came 457,000 tons or \$59 million of paper grades of bleached sulphite pulp used for book, writing and tissue papers. Most valuable per ton were the dissolving grades of bleached sulphite pulp, exports of which amounted to 330,000 tons and \$58 million. This is the raw material for rayon, cellophane, photographic film, nitro-cellulose and plastics.

The United States has long constituted much the largest market for Canadian pulp exports. Of the total volume exported, that market took 81% in 1926, 80% in 1937, 82% in 1951 and 79% in 1955. In 1955, the United States purchased more than half of Canada's exports of each grade of wood pulp.

The second largest external purchaser of Canadian wood pulp is the United Kingdom. By volume, the United Kingdom took 11% of total exports in 1926 (mostly groundwood), 10% in 1937 (mostly chemical pulp), 10% in 1951 and 12% in 1955. Exports to Japan have fluctuated widely, falling from \$16.9 million or 4.6% of total pulp exports in 1951 to \$5.5 million or 1.9% of the total in 1955. In the latter year dissolving pulp represented 90% of the total value. Four Continental countries — France, the Federal Republic of Germany, Italy and Belgium-Luxembourg — accounted for 6.3% of the value of Canada's total exports of wood pulp in 1951. Subsequently, exports to each of these markets have fallen sharply, although this has been offset to a small extent by increased exports to the Netherlands and Switzerland.

(b) Canadian Production

While Canada's production of chemical pulp has expanded more rapidly than groundwood, the predominance of the latter as a raw material for newsprint has meant that a larger volume is still produced. In 1955 ground-

wood production was 5,467,000 tons while chemical pulp was 4,359,000 tons. Chemical pulp production, however, had more than double the value of groundwood.⁶⁷

Most of Canada's pulp production is used in the domestic manufacture of newsprint and other products, with newsprint taking approximately 65% of the total output. Thus, in 1955, 23% of Canadian pulp production was exported. As most mechanical pulp goes directly into newsprint, exports took only 5% of production. In the case of chemical pulp, however, 48% was exported. These percentages have changed with Canadian industrial progress. From 1908 to 1910, 60% to 70% of pulp production was exported. In the postwar period, exports have varied between 20% and 24% with no clear trend being evident.⁶⁸

(c) *Canada's Place in World Production and Trade*

Canada has far from the dominant position in wood pulp that she has in newsprint. According to the brief presented to the Commission by the Pulp and Paper Association, in 1955 Canada produced 49% of the world's newsprint and supplied 80% of the world's exports of this commodity. In wood pulp, however, Canadian production in 1954 was only 23% of the world total, apparently excluding production in the Soviet bloc, and was far exceeded by the United States with 44%. World exports of wood pulp equalled only 18% of world production and, of this amount, Canada's share was 29% as compared with 33% for Sweden and 17% for Finland. According to data published by the United Nations, Canada produced about the same share of the world total in 1954 as in 1929 and 1937. The United States share, however, rose from 27% in 1929 and 26% in 1937 to 43% in 1954.⁶⁹

Although the import of newsprint and wood pulp has been duty free since 1913, the bulk of United States pulp consumption comes from domestic production. In 1955 gross imports were only 10% of the total supply (production plus imports minus exports) and net imports only 7%.⁷⁰ In 1954 the United States was second in gross imports to the United Kingdom, with each accounting for about 30% of the world total.⁷¹

Since 1929 there has been a substantial change in the United States position. Between 1929 and 1937, gross imports of wood pulp varied between 27% and 32% of the supply available for domestic consumption. The ratio fell to 23% in 1938 and 1939 and, since 1947, it has fallen from 16% to 10%. The absolute volume of imports increased somewhat up to 1937.

⁶⁷ D.B.S., *The Pulp and Paper Industry, 1955*.

⁶⁸ *Ibid.*

⁶⁹ *Association Brief*, pp. 19 and 78; and United Nations, *Statistical Yearbook, 1955*.

⁷⁰ U.S. Department of Commerce, *Survey of Current Business*, March 1956.

⁷¹ *Association Brief*, p. 78.

Since then, however, it has never reached the level of that year. Meanwhile, domestic production more than tripled between 1937 and 1955. Imports in 1955 were not only below 1937, but were also below the levels reached in 1936, 1947, 1950 and 1951, while total supply in 1955 was at an all-time high.⁷² But while total United States pulp imports have not risen, United States import data show that those from Canada have considerably more than doubled since 1937 as a result of their replacing supplies from overseas sources. In 1955, 84% of United States imports by volume came from Canada.

In 1954 the United Kingdom depended upon imports for 93% of its pulp supply, making it the world's largest importer.⁷³ Although pulp imports from non-sterling area sources were subject to non-discriminatory quotas,⁷⁴ the U.K. trade data show that, from 1950 to 1955, the most important sources of U.K. supplies were Sweden, Finland and Norway, with Canada occupying fourth place. In 1955 the major suppliers of pulp and waste paper were Sweden with 35% of the volume imported, Finland with 20%, Norway with 19%, Canada with 12%, the United States with 8% and the U.S.S.R. with 3%, the last two having increased their shares considerably over previous years. The 12% from Canada in 1955 compared with about the same share in 1951, 7% in 1950 and 2.8% in 1937.⁷⁵

(d) *Market Outlook*

Table 6 sets forth the Pulp and Paper Association's projections for wood pulp exports and converts them into dollar values on the basis of unit values in the first half of 1956. On this basis, the volume of total exports would increase by 106% between 1955 and 1980 and the value would rise by 114%. Exports to the United States would slightly less than double in volume and fall from 79% to about 75% of the total volume and value.⁷⁶

Projections for production, imports, exports and total supply by areas were compared with experience in 1954 in a table in the Association Brief.⁷⁷ There it can be seen that, while Canadian production was expected to increase by 116% between 1954 and 1980, production in the rest of the world, apparently excluding the Soviet bloc, was expected to rise by only 67%. Production in the United States would almost double, but that in Sweden, Finland and Norway would increase by only 21%. Of the total increase in exports expected to occur, 71% was projected as being accounted for by Canada and 14% each by the United States and Finland. Thus Canada

⁷² U.S. Department of Commerce, *Business Statistics 1955, Supplement to the Survey of Current Business; and Survey of Current Business*.

⁷³ *Association Brief*, p. 78.

⁷⁴ See footnote 80 regarding the removal of these quotas.

⁷⁵ While the data for 1955 are for pulp and waste paper, those for previous years are for wood pulp. The figure for 1937 includes most, if not all, imports from Newfoundland.

⁷⁶ See also John Davis *et al.*, *op. cit.*, Chap. 5.

⁷⁷ *Association Brief*, p. 78.

Table 6

CANADA'S EXPORTS OF WOOD PULP 1954-56 AND PROJECTIONS FOR 1980

	U.S.	U.K.	Other Europe	Other countries	Total
Volume (thousands of tons)					
1954 — D.B.S. (a) and C.P.P.A. (b).....	1,670	271	101 (c)	138	2,180
1955 — D.B.S. (a).....	1,869	281	113 (c)	103	2,366
1956 (Jan.-June, Annual rate) — D.B.S. (a).....	1,967	194	83 (c)	114	2,358
1980 — C.P.P.A. (b).....	3,669	634	315	263	4,881
Value (Cdn. \$ mm.)					
1955 — D.B.S. (a).....	234	35	16 (c)	13	297
1956 (Jan.-June, Annual rate) — D.B.S. (a).....	252	25	12 (c)	16	305
Unit value (\$ per ton)					
1955.....	125.10	124.08	137.33	126.94	125.65
1956 (Jan.-June).....	128.00	128.86	142.45	142.88	129.30
Value (Cdn. \$ mm.)					
1980 (at Jan.-June 1956 average values).....	470	82	45	38	635 (d)

(a) D.B.S., *Trade of Canada*.(b) Canadian Pulp and Paper Association, *Submission to Royal Commission on Canada's Economic Prospects*, Montreal, January 1956, p. 77.

(c) Includes Ireland and the U.S.S.R.

(d) Sum of values to the four areas. The calculated figure based upon the unit value of 129.30 is 631.

would become by far the most important exporter, accounting for 43% of the 1980 total. Further, 58% of the total growth in consumption (supply) and 52% of the total growth in imports was expected to be accounted for by the United States.

The Association Brief stated that the future of Canadian shipments to the United States was difficult to assess but that the United States demand for pulp and paper products was such that import needs appeared likely to increase. Thus it assumed a doubling of total United States imports between 1954 and 1980 based on the study by Stanford Research Institute, and an increase in the Canadian share from 81% in 1954 to 89% in 1980.⁷⁸ It may, however, be asked if the Stanford projections might not have been low on both pulp consumption (e.g., in newsprint manufacture) and production as it appears that they were in the case of newsprint. As regards Canada's ability to sell pulp in the United States, there again arise the various problems concerning southern pine, northeastern hardwoods, tropical hardwoods and governmental policy which were noted in the preceding section.

The Canadian Pulp and Paper Association reached one conclusion from the Stanford Study. Management Research (Western) Ltd. reached another. Despite the doubling of demand anticipated, the great expected increase in United States production led this group to state in its brief to the Commission for the Forest Industry Associations of British Columbia that the export of pulp and paper products from Canada to the United States might not increase more than about 10% in the next 20 years.⁷⁹

Between 1954 and 1980, the Association Brief expected that United Kingdom available supply of pulp would rise by 33% and imports by 35%. Almost half of the increase in consumption was expected to come from Canada, so that Canadian exports would increase by 134% and constitute 22% of total imports in 1980.⁸⁰

Turning to continental Europe, it was expected that supply outside the major producing areas of Sweden, Finland and Norway would increase by 21% between 1954 and 1980. As production was expected to rise even less rapidly, imports would increase by 30%. An increase in the Canadian share of these imports from 4% to 11% would mean that Canada's exports to these countries would rise by 266%.⁸¹ The chief question here would seem to be why the projected increase in consumption is so small — 21% as compared

⁷⁸ *Ibid.*, pp. 73-74, 77 and 78.

⁷⁹ Management Research (Western) Ltd., *Brief* submitted to the Royal Commission on Canada's Economic Prospects on behalf of Forest Industry Associations of British Columbia, Vancouver, October 1955, p. 30.

⁸⁰ *Association Brief*, pp. 77-78.

In July 1956, it was announced that the United Kingdom had removed import controls on wood and other pulps, and some papers and paperboard, by placing these commodities under world open general license. The Board of Trade, however, was reported to have stated that imports could be freed without any "relatively substantial variation in the present level of expenditure" because U.K. demand had leveled off. (United Kingdom Board of Trade, *Notice to Importers* No. 787, 17 July, 1956; and *The Financial Post*, Toronto, July 28, 1956.)

⁸¹ *Association Brief*, pp. 77-78.

with 96% from a much higher base in the United States. A similar question could be asked with respect to the 30% forecast for the producing areas of Sweden, Finland and Norway and with respect to the 33% for the United Kingdom. The Association Brief suggested that the demand for pulp and paper products of the Continental countries together with the United Kingdom was likely to increase by 75%. In absolute terms, the demand suggested was 20 million tons in pulp equivalents, whereas the paper mill capacity to use pulp was projected at 14.4 million tons. Some part of this deficit of 5.6 million tons was covered by Canadian exports of newsprint (projected at over one million tons) and other grades of paper and paper-board. If requirements did reach the equivalent of 20 million tons, however, a further increase in market pulp demands on Canada in the order of 2 million tons "is not inconceivable". This would be an increase above the total of 949,000 tons in the projection.⁸²

Latin American production and consumption were both expected to increase rapidly. Imports were expected to increase less rapidly than production and to drop from 56% to 42% of total supply. If Canada continued to supply about the same proportion of total imports (24%) her exports to these countries would double.⁸³

Considerable expansion was anticipated in the pulp consumption of Asia, Africa and Oceania. However, only a 5% increase was expected to take place in Japan, Canada's third largest pulp market — an increase which would seem to be significantly out of line with the Japanese six-year economic plan.⁸⁴ For Asia, Africa and Oceania as a whole, Canada was expected to have a somewhat smaller share of the growing market, so that Canadian exports would rise by 83% between 1954 and 1980. If, however, the expectations for the underdeveloped countries were approximately right, Canadian exports might grow more rapidly than this because of the underestimation of the Japanese situation and the assumption that no Canadian pulp at all would move to Australia, New Zealand or the Commonwealth countries in Africa.⁸⁵

In conclusion, the best approach to a forecast would seem to be to accept about the dollar values derived from the projections by the Canadian Pulp and Paper Association. As with those projections, it is assumed that Canada can supply anticipated domestic and export requirements. It should, however, be stressed that the figure for exports to the United States may turn out to be too high and those for exports to other countries may be too low. The projection for the United States involves future stability in what has been a declining ratio between gross imports and supply and thus a doubling

⁸² *Ibid.*, pp. 76-77.

⁸³ *Ibid.*, pp. 77-78.

⁸⁴ "A Gist of Integrated Economic Plan, drafted by the Economic Council and submitted to the government for its consideration", November 5, 1955.

⁸⁵ *Association Brief*, pp. 77-78.

of total imports between 1954 and 1980, whereas since 1937 imports have actually fallen in volume. As Canada is already supplying over 80% of this import market, the historical development may give rise to some doubts as to the future. The trend in the United States has been to integrated production of forest products and to greater self-sufficiency in wood pulp. It has been reported, however, that "a furious scramble for pulpwood is propelling Southern timberland prices skyward".⁸⁶ In these circumstances, it may be that a doubling of consumption would involve a doubling of imports. The conservative nature of the projections of growth in pulp consumption in overseas countries, however, may offset some of the concern with respect to the United States forecast. Accordingly, the following projections are offered for exports in 1980: United States, \$475 million; United Kingdom, \$85 million; other Europe, \$50 million; other countries, \$40 million; total exports of wood pulp to all countries, \$650 million.

11. Other Forest Products

(a) General Export Position

In addition to exports of the three major products of her forest industries — lumber, newsprint and wood pulp — Canada also exports a number of other forest products. While the total value of these exports falls far short of that achieved by any one of the major items, it is nevertheless significant, and amounted to \$172 million in 1955. The nature of these exports in the years 1937, 1954 and 1955 is indicated in the following table.

Canada's Domestic Exports of Other Forest Products
(thousands of Canadian dollars)

	1937	1954	1955
Shingles.....	6,188	24,182	29,145
Plywood }	1,293	{ 10,483	{ 16,273
Veneers }		{ 11,072	{ 13,831
Christmas trees.....	522	4,816	5,864
Pulpwood.....	12,088	45,766	48,655
Other unmanufactured or partially manufactured wood (a).....	13,970	20,599	19,507
Other manufactured wood (b).....	4,496	5,862	7,164
Building board, paperboard, etc....	5,085	6,231	10,729
Other paper (c).....	4,613	14,038	17,633
Books and printed matter.....	981	3,495	3,625
Total.....	49,236	146,544	172,426

(a) Also excludes planks and boards.

(b) Excludes wood pulp.

(c) Also excludes newsprint paper.

⁸⁶ *The Wall Street Journal*, New York, March 26, 1956.

Much the most important in the group is *pulpwood*. These exports grew in value from about \$12 million in the years immediately preceding the war to \$68 million in 1951 and then declined, amounting to \$49 million in 1955. In 1955, 81% of Canada's exports of pulpwood went to the United States, 9% to the United Kingdom, 4% to France and somewhat over 3% to the Netherlands. Throughout the period, the United States has taken the bulk of the exports, although the United Kingdom has increased in importance since the prewar and early postwar years.

The shift which took place in Canada's trade, from exporting pulpwood to exporting wood pulp and newsprint, is well known. In 1908, 64% of apparent Canadian pulpwood production was exported and exports exceeded Canadian consumption until 1912. Subsequently, Canadian use of pulpwood has grown rapidly and exports in 1955 accounted for only 11.4% of production. Despite the magnitude of the demand of Canadian pulp and paper mills, exports of pulpwood have shown some increase in volume over the period, although in each year 1953 to 1955 they were only slightly higher than they had been in 1937.⁸⁷

Almost all of Canada's exports of *shingles* are red cedar and these are shipped virtually entirely to the United States. Exports reached a peak value of \$32 million in 1950. Subsequently they declined, but in 1955 had recovered to \$29 million. In that year, however, they were only 19% above their 1937 volume.

Three-quarters or more of Canada's small exports of *plywood and veneers* in the immediate prewar years were taken by the United Kingdom. In 1955, however, the United States market accounted for 88% of these exports. Most of the remainder, or 10% of the total, went to the United Kingdom. Of the \$30 million of exports in 1955, \$3.6 million consisted of softwood plywood. The bulk of this commodity went to the United Kingdom but sales to New Zealand, Arabia and Cuba exceeded those to the United States. On the other hand, the \$12.6 million of hardwood plywood, the \$4.2 million of softwood veneers and the \$9.6 million of hardwood veneers went almost entirely to the United States. Since 1947 the volume of plywood exports to all countries has declined 10% while that to the United States has quadrupled. Over the same period, the volume of exports of veneers has gone up by 317% while exports to the United States have risen by 1,350%.

In addition to the export of *Christmas trees*, largely but not entirely to the United States and valued at \$6 million in 1955, Canada sells abroad a number of other items in the *unmanufactured or partially manufactured wood* group. These include logs, pit props, telegraph and telephone poles, railroad ties and square timber. The value of these exports has not increased in step with the value of exports of other forest products, amounting to \$14 million in 1937 and to \$19.5 million in 1955. Trade in a number of these items has

⁸⁷ D.B.S., *The Pulp and Paper Industry, 1954 and 1955*.

been subjected to severe fluctuations in the postwar period. Thus United Kingdom purchases of pit props have fallen from 338,000 cords in 1947 to 96,000 cords in 1955. Over the same period, U.K. purchases of Douglas fir railway ties declined from 741,000 to 505,000 ties; shooks of wood for boxes fell in value from \$1.7 million to less than \$3,000; and spoolwood fell from 15 million feet to less than four million feet. For these items, 58% of 1955 exports went to the United States.

Exports of *manufactured wood other than wood pulp and paper* have increased only modestly in dollar value from 1937 to 1955, in which year they totalled \$7 million. In part, this can be explained by such developments as the disappearance of the export of wood doors to the United Kingdom which in 1937 had a value of \$2.7 million. On the other hand, U.K. purchases of match splints rose in value from \$300,000 in 1937 to \$1.1 million in 1955. Of this group of exports as a whole, sales to the United States accounted for 57% of total exports in 1955.

In 1955 the United States took 82% of Canada's \$4.3 million of exports of *building and insulating board*, 97% of the \$1.5 million of *pulpboard for wallboard*, and 42% of the \$5.0 million *paperboard, n.o.p.* In the cases of building and insulating board and paperboard, n.o.p., these percentages were up very sharply from 1947. The United Kingdom, however, accounted for 53% of Canada's 1955 exports of paperboard, n.o.p. While 1955 exports of building and insulating board were considerably above 1947 levels, those of the other two items in this group were below 1947 in both volume and value.

Exports of *other paper* in 1955 were valued at nearly \$18 million and included \$5.9 million of book, printing and lithograph paper (\$4.4 million to the United States); \$3.2 million of wrapping paper (\$1.4 million to the United States, and about \$700,000 each to the United Kingdom and the Union of South Africa); \$2.4 million of uncut bond and writing paper to a number of countries other than the United States; \$2.9 million of mutilated newsprint paper and other waste paper, almost entirely to the United States; and smaller values of other types of paper and paper manufactures. The total value of these exports shows a substantial increase over 1937. Finally, exports of *books, newspapers, magazines and other printed matter* go to many countries but principally to the United States.

(b) *Market Outlook*

Turning to the export prospects for the various commodities considered in this section, and first to *shingles*, the chapter on lumber and allied products in the Commission's study on the forest industries notes that the British Columbia industry has in recent years shipped to the United States about the same quantity of red cedar shingles as have been produced in the United States. Canada as a whole has supplied 35% to 40% of the total United States consumption of shingles and shakes. The declining trend in shingle

consumption is noted, as is also the efforts of the industry to improve and to make more acceptable its product. The large resource of cedar in British Columbia compared with that in the United States would seem to make possible exports in 1980 at least at the level of recent years. If the promotional work proves successful, exports of cedar shingles to the United States could increase substantially. The forces of competition are expected to mean that shingle prices do not rise relatively to other prices. On the other hand, a higher degree of manufacturing at the factory would seem a likely development, increasing the average value of shingles exported.⁸⁸

The Commission's study notes the estimate of Stanford Research Institute that total United States consumption of shingles and shakes would fall from 6.2 million squares in 1952 to 4.4 million squares in 1975, of which 2.4 million would be imported.⁸⁹ In 1955 Canada exported 2.4 million squares of red cedar shingles to the United States, although United States trade data show imports of 2.8 million squares of shakes and shingles in 1955 coming almost entirely from Canada. The brief submitted to the Commission on behalf of the Forest Industry Associations of British Columbia predicted that the industry might succeed in keeping the demand for shingles and shakes at the same quantity level that has existed over the past ten years.⁹⁰

In the chapter on lumber and allied products in the forest industries study, a relatively pessimistic view is taken of the prospects of further increases in Canada's exports of *plywood and veneers*. Exports take up only a small proportion of Canadian softwood plywood production. Softwood plywood entering the United States is subject to a 20% tariff and it is felt unlikely that the Canadian industry could compete successfully with the United States plywood industry with such a tariff. In the United Kingdom, Canadian softwood plywood competes with low-cost building board from Sweden and Finland and, unless Canadian prices are lowered relative to European hardboard, it would not appear that any marked expansion of exports to the United Kingdom could be expected. Nor is it felt that exports to other countries could be increased significantly. In the relatively new hardwood plywood industry, exports of yellow birch plywood to the United States have taken an important share of Canadian production. Canada will probably continue to have an export market in the United States where it is noted that *Timber Resource Review* estimated that demand for hardwood plywood and veneer would double between 1952 and 1975. Nevertheless, large quantities of hardwood raw material are available in the United States, while readily accessible supplies of high quality birch have been diminishing in Canada. Also there is growing competition in the United States market from imported plywoods made of tropical woods. Japan has been the chief

⁸⁸ John Davis *et al.*, *op. cit.*, Chap. 4.

⁸⁹ Stanford Research Institute, *op. cit.*, p. 70, and appended table.

⁹⁰ Management Research (Western) Ltd., *op. cit.*, p. 26.

source of this plywood in the last few years. Thus it is assumed in the study that 1980 exports will be no larger than average exports in 1952-54.

Softwood veneer is exported mainly by one company in British Columbia which has a plywood plant in United States. It is felt that it would not seem likely that any great increase in exports will occur unless other Canadian companies establish plywood plants in the United States. As regards hardwood veneer, with growing demand for plywood and veneer in the United States, the opportunity for sales of veneer in that market should increase in the future. Again, however, the supply of birch veneer logs may be the limiting factor and may not allow increased exports of birch veneer.

In considerable measure, future exports of Canadian plywood and veneers would seem to turn on developments in the United States tariff and on the availability of birch peeler logs. It may not be unreasonable to anticipate some increased United States willingness to accept imported construction materials including plywoods, but it would be dangerous to predict a substantial increase in Canadian exports upon this basis. Unless it can be established that the supply of birch logs is adequate, only a moderate increase in Canada's exports of plywood and veneers can be predicted.

Turning to the future of Canada's exports of the *other wood* (as opposed to paper) items, it may be suggested that, with growing United States population and pressure upon domestic resources, it is to be presumed that it will be possible to increase exports of Christmas trees. In pulpwood, exports will reflect the pull of demands by the pulp and paper industries in Canada and the United States. While exports may not increase, the assumption of continued border trade is perhaps reasonable. It is, however, to be recalled that since 1937-38 there has been very little increase in the volume of Canada's exports of pulpwood.⁹¹ Pulpwood and some of the other wood items may well increase in price in much the same fashion as does lumber. Special factors, however, affect other of these exports, such as pit props to the United Kingdom. Manufactured wood products may be expected to continue to face protectionism in many markets in which they might otherwise be sold in larger volume.

The chapter on lumber and allied products in the Commission's forest industries study is as pessimistic on export prospects in *hardboard and insulating board* as it is on plywood and veneers. Canada's hardboard industry is primarily a domestic one; in 1952-54, 27% of production was exported. The quantity of sawmill waste and low-cost wood available in the United States for the manufacture of fibreboard would suggest that that country will be able to supply its own requirements and that Canadian producers could not effectively compete in the market where they are faced with a 7.5% duty. While Canada's exports to the United States in 1955 were considerably larger than the average figure for the three previous years,

⁹¹ Stanford Research Institute appeared to suggest a decrease in U.S. imports of Canadian pulpwood (*op. cit.*, pp. 25 and 58).

capacity in the United States is being expanded and it is stated that exports to the United States could be reduced in the next few years. In the United Kingdom and other markets, Canadian hardboard has been unable to compete on a price basis with low-cost board from Europe. Exports, therefore, may be about equal to the 1952-54 average, or below 1955. The price of hardboard is expected to remain constant relative to the general level of prices.⁹²

The insulating board industry serves mainly the domestic market with exports in recent years being only about 1% of production, although they increased in 1955. There is a tariff of 7.5% on shipments to the United States and Canadian producers have not developed a permanent market in that country. It is conceivable that a larger and steadier market in the United States could be developed but, because the industry is able to use a wide variety of raw materials, United States producers should be able to supply the domestic requirements. In overseas markets Canadian board meets competition from low-cost board from Europe and it is unlikely that a large overseas market could be developed.

The brief to the Commission by the Canadian Pulp and Paper Association discussed *paperboard* along with *other pulp and paper products*, excluding newsprint. That discussion noted certain general factors which affected this branch of the industry and which helped to account for the fact that the bulk of its production went to the domestic market. Included are the facts that these products must generally face tariff barriers, and the smaller volume of operations in Canada as compared with those in the United States. Generally, however, it was assumed that the export and the domestic market would grow together.⁹³

As regards *paperboard* (*containerboard and boxboard*), the Association Brief noted that before the war 16% of Canadian production was exported. Since the war the figure had been about 10%. It was, however, assumed that growing world requirements over the next 25 years might be expected to result in a relative increase in export demands on the Canadian industry and that exports might about double. The Pulp and Paper Association also treated *building boards and building papers*, including hardboard and insulating board, in this section of its brief. Projections on these items were offered only very tentatively but allowance was made for increased exports.⁹⁴

Turning to *book, writing and groundwood papers*, the Association Brief noted that 50% of Canada's production of groundwood papers was exported, but only about 5% of the book and writing papers. Canadian consumption of these papers was expected to do more than double between 1954 and 1980

⁹² Stanford Research Institute (*op. cit.*, pp. 26, 40 and 66) suggested the possibilities of price declines and a tripling of the U.S. use of hardboard.

⁹³ *Association Brief*, pp. 54-58.

⁹⁴ *Ibid.*, pp. 62-66.

and exports about to double. The export projections were based on the assumption that exports would equal 15% of total demand for these grades, which was regarded as being probably a conservative figure. Exports of *wrapping or kraft papers* amounted to about 15% of Canadian production in the late 1920's and during the 1930's. The volume, however, was not large. Since the war, the volume had declined somewhat to about 5% of production. Currency restrictions had operated to reduce exports to traditional Commonwealth markets which could be reached under the Commonwealth preferential tariff, while the United States tariff prevented substantial entry into that market. For the future it was expected that Canadian production would about double and exports almost triple by 1980. Production of *tissue and sanitary papers* had been almost entirely for domestic consumption and, while production of these papers was expected to continue to grow, no attempt was made to project exports or imports.⁹⁵

Canada's *fine and specialty paper* industry was dealt with in a submission to the Commission by the President of Howard Smith Paper Mills Limited. The grades covered in this submission included book, writing and ground-wood papers, tissue and sanitary papers, and certain grades of bleached and semi-bleached wrapping papers. Sixteen per cent of Canadian production of these grades was exported and no reason was seen to expect any substantial increase in the export of any of the grades covered, except ground-wood printing and specialty papers. Various reasons were noted why Canadian costs in this field tended to be above those of United States mills. While power might be reasonably cheap in Canada, power was a much less important factor in the manufacture of fine paper than in the manufacture of newsprint. Because of the limited Canadian markets, white paper products could not be mass produced in Canada. The submission, however, included data prepared by the staff of the Canadian Pulp and Paper Association covering fine paper and book papers. These projections indicated that, by 1980, the demand for the grades in question would be about two and one-quarter times what it was in 1955 and it was stated that, if this occurred, Canadian mills would have taken a long step toward attaining mass production with its attendant benefits. The projections showed exports of each of these grades approximately doubling between 1960 and 1980.⁹⁶

Projections for the individual items covered in this section suggest that Canada's exports of "other forest products" may increase from \$147 million in 1954 and \$172 million in 1955 to about \$250 million in 1980, although little confidence can be placed in the constituent items. While this is a relatively modest increase in comparison with other items in the forest products group, it will be recalled that little or no volume increase can be anticipated in the two largest items, namely, pulpwood and shingles.

⁹⁵ *Ibid.*, pp. 58-62 and 66-71.

⁹⁶ E. Howard Smith, President, Howard Smith Paper Mills Limited, *Canada's Fine and Specialty Paper Industry*, Submission to Royal Commission on Canada's Economic Prospects, January 19, 1956.

12. Asbestos

(a) General Export Position

Canada's domestic exports of unmanufactured asbestos have risen from 292,000 short tons in 1929 to 391,000 tons in 1937 and to just over a million tons in 1955. The total value of exports of asbestos and its products increased from \$13 million in 1929 to \$15 million in 1937 and to \$98 million in 1955.⁹⁷ Imports, consisting entirely of asbestos manufactures, amounted to \$4.1 million in 1955 — somewhat greater than the value of manufactures included among exports.

Much the most important market for Canadian asbestos is the United States. In 1955 exports to that country amounted to 57% of the total and were followed by those to the United Kingdom, amounting to 10%. Other important markets were the Federal Republic of Germany, France, Australia, Belgium-Luxembourg, Japan, and certain Latin American countries.

Sixty-five per cent of the value of Canada's 1955 exports of asbestos and its products was in the form of milled fibres. Larger in volume, but accounting for only 32% of the value, was asbestos waste, refuse or shorts. Crude asbestos accounted for 0.5% of the total and asbestos manufactures for 3% (considerably higher than in recent previous years). Exports to the United States were about evenly divided in value between the two major categories, with milled fibres somewhat more important. Milled fibres, however, were considerably more important in exports to the more distant major markets, although the United Kingdom and the Federal Republic of Germany took about an equal volume of waste, refuse or shorts.

(b) Canadian Production

A high proportion of Canadian asbestos production is exported. In 1954 and 1955 exports accounted for 96% and 94%, respectively, of all shipments of unmanufactured asbestos by Canadian mills. Production in Canada has risen rapidly over the past 30 years. In 1937 shipments were 47% above those of 1926, and from 1937 to 1955 they rose by 159%.⁹⁸

(c) Canada's Place in World Production and Trade

In terms of total tonnage shipped, Canada is much the largest producer of asbestos in the world. On the basis of data from the United States Bureau of Mines, Canada accounted for 61% of world production in 1954, followed by the U.S.S.R. with an estimated 16%, the Union of South Africa with 7% (not including the 2% from Swaziland), Southern Rhodesia with 5%, and the United States with 3%.⁹⁹

⁹⁷ In the first ten months of 1956, the volume of exports was down by 2% and the value up by 9% over the same period of the previous year.

⁹⁸ D.B.S., *Asbestos*, January 1956; *The Asbestos Mining Industry, 1955*; and *Annual Report on the Mineral Production of Canada, 1935 and 1945*.

⁹⁹ Data presented by D.B.S. in *The Asbestos Mining Industry, 1955*. While data in general represent production, the figure for Canada is for sales.

Asbestos is not a homogeneous commodity but varies in chemical composition and in length of fibre. Long-fibre asbestos can be spun and is used in making clutch facings, brake linings, fireproof curtains, clothing and other textiles, electrical tape, sheet packings, insulating blankets for steam turbines, gaskets and acid filters. Short fibres are used principally in the production of numerous types of building materials, *e.g.*, combined with cement in the making of roofing and siding materials. Relatively little of Canada's asbestos (chrysotile) production has been classified as being in the spinning grade, the chief export sources of which have been in southern Africa. In addition to the matter of the length of the fibre, Canadian asbestos has had too much iron for use where high electrical resistance is required and Southern Rhodesia has been the chief source of such asbestos. But at the same time as long-fibre and low-iron asbestos have been more desirable for a number of purposes, including strategic uses, short-fibre asbestos is used in much larger volume. Thus, in 1950 the United States consumed about 700,000 tons of short fibre as against 30,000 tons of the spinning grades. Further, this picture has been altered by the development of the deposits in the Cassiar district of British Columbia which contain an exceptionally large proportion of low-iron spinning fibre.¹⁰⁰

The United States, although the world's largest consumer and manufacturer of asbestos products, depends upon imports for 92% to 96% of its total needs of asbestos and for at least 99% of its requirements of spinning grades.¹⁰¹ United States trade statistics show that imports of unmanufactured asbestos, which enters free of duty, amounted to 705,000 short tons in 1950 and 740,000 tons in 1955. Of this latter amount 699,000 tons came from Canada, 37,000 tons from southern Africa and 4,000 tons from other countries.

In 1955 Canada supplied 48% of the volume and 37% of the value of United Kingdom asbestos imports, with almost all of the remainder coming from southern Africa. This compares with a 1937 Canadian share of 37% of the volume and 27% of the value. Thus, Canada has achieved a higher postwar share of an import volume which almost tripled. Shipments from southern Africa, however, still exceed those from Canada and, because of the cheaper grade product produced in Canada, the excess is greater in value than in volume.

(d) *Market Outlook*

As regards the future demand for asbestos, the Paley Report expected that United States consumption would continue to grow but at a slower rate than had been experienced in the past. In 1975, the demand for spinning grades was expected to be about 50,000 short tons and that for short-fibre

¹⁰⁰ *Paley Report*, Vol. II, p. 91; and U.S. Department of the Interior, Bureau of Mines, *Mineral Facts and Problems*, Bulletin 556, U.S. Government Printing Office, Washington, D.C., 1956, pp. 77-85.

¹⁰¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 81.

grades about one million tons. This would mean an increase in the use of short-fibre asbestos of 43% above 1950. United States domestic resources were not expected to meet more than the small fraction of the demand that they had in the past. For other countries of the free world, the same rates of growth were assumed. Reserves in Canada and southern Africa appeared adequate to support this increase.¹⁰²

The Paley Report noted, however, that substitution for asbestos was a possibility. Glass fibres were already providing some competition, but general substitution was not in sight as long as the production costs of chemically stable glass fibres continued to be high. Not much headway had been made in the development of synthetic asbestos. More favourable to Canadian prospects, the Report also noted that the future might well bring increasing intensification and diversification of processing methods for natural asbestos, ultimately permitting the production of a variety of grades from one stock.¹⁰³

The more recent study by the United States Bureau of Mines stated that until recently the major problems in asbestos were procurement of adequate supplies of both ordinary and low-iron chrysotile; purification of ordinary asbestos to render it acceptable as a low-iron type; substitution of other materials (such as fibre glass) for both low-iron and ordinary asbestos; and development of substitutes for amosite (produced exclusively in Africa). With increasing Canadian mill capacity, the production of low-iron chrysotile in British Columbia and the development of substitutes for amosite, the situation had changed sharply in 1954.¹⁰⁴

The Bureau of Mines stated that the trend in United States asbestos consumption followed the trend of industrial production and building construction. Because of its fire resistant, fibrous structure, asbestos was constantly finding new uses where satisfactory substitutes were uncommon, and a strong and growing demand for asbestos was anticipated by the industry. To meet these needs, production facilities were increasing. In the Quebec asbestos area, a large new mill has recently come into production and another one was ready for operation early in 1955. A new asbestos mining project involving the expenditure of many million dollars would probably reach the production stage in four or five years.¹⁰⁵ In northern British Columbia, a new mill went into regular production in July 1954. The deposit contained an exceptionally large proportion of low-iron spinning fibre. Annual production, beginning July 1, 1954, was estimated by the company at 10,000 tons of spinning fibre. Several mines in the Union of South Africa and Southern

¹⁰² *Paley Report*, Vol. II, pp. 91-92.

¹⁰³ *Ibid.*, Vol. II, p. 92.

¹⁰⁴ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 77-85.

¹⁰⁵ The press has contained a number of reports on the expansion of Quebec facilities. See for example *The Financial Post*, Toronto, January 21, February 4, and May 26, 1956; and *The Gazette*, Montreal, May 22, June 25, July 20, and September 10, 1956.

Rhodesia were expected to reach the production stage in the near future. No significant new sources of asbestos, however, were in sight in the United States.

One of the most critical situations in asbestos had been the shortage of low-iron chrysotile used by the United States Navy for electric cable insulation. Conditions had, however, changed greatly with the new development in British Columbia which would evidently produce about five times as much as had been obtained from Southern Rhodesia and as a result of new designs of shipboard cable which did not require non-ferrous asbestos fibre. At the same time, it was noted that research was continuing on removing iron from Canadian asbestos to make it suitable for electrical insulation.

The future of the Canadian asbestos mining industry was considered in a submission to the Commission by Mr. A. L. Penhale, President and Managing Director of Asbestos Corporation Limited. This consideration was based upon the assumptions, *inter alia*, that synthetic asbestos would not become a commercial reality and that Canadian asbestos ore reserves, though already adequate to sustain production at present or even greatly increased rates of production for at least 25 years, would be substantially augmented during that period. With respect to the latter of these assumptions, Mr. Penhale examined the matter of ore reserves and their replacement and concluded that, from this examination, "it will be surmised that the Canadian asbestos mining industry has little to fear from depletion of its deposits during this century or even beyond."¹⁰⁶ With these assumptions, it was stated to be confidently expected that production and sales of Canadian asbestos would increase 80% between 1955 and 1980. This outlook was primarily predicated on the projected economic trends for industrial countries, notably the United States. The geographical distribution of Canadian asbestos fibre sales was not expected to vary appreciably from the present pattern, although the relaxation of trade barriers would likely result in increased shipments to some areas, notably certain countries in South America. The industrialization of other countries would also give rise to expanding markets for asbestos products. Various reasons were given why the large scale processing in Canada of asbestos for world markets was not considered economically feasible under present conditions: asbestos is usually only a minor component of the manufactured article; competition is severe in the field of building materials and the freight on asbestos cement products rules out their manufacture at a distance; manufactures bear duties whereas raw asbestos generally moves free of duty; and the capital investment required would be huge. It was felt that export duties on raw asbestos, to encourage and enlarge domestic manufacturing industry, would jeopardize the competitive position of Canadian asbestos. In the course of his sub-

¹⁰⁶ A. L. Penhale, President and Managing Director, Asbestos Corporation Limited, Thetford Mines, Quebec, and President of the Canadian Institute of Mining and Metallurgy, *Memorandum to the Royal Commission on Canada's Economic Prospects on the Subject of The Canadian Asbestos Mining Industry*, Montreal, February 22, 1956.

mission, Mr. Penhale also noted that, apart from any other considerations, competition from South African and Rhodesian fibre was more pronounced in countries whose economies were oriented toward sterling. Russian asbestos was generally sold more cheaply than Canadian and often for payment in local currencies under barter or trade agreements. Its quality was intrinsically as good but its preparation for market had lacked the care and uniformity of treatment accorded to Canadian production.

With respect to deposits outside the Province of Quebec, asbestos is also mined near Matheson in Northern Ontario. There have recently been favourable reports on developments in Newfoundland and the suggestion that one mine might be producing within three years.¹⁰⁷ The Mining Association of British Columbia noted that the Cassiar Asbestos Corporation, the property of which came into production in 1953, had plentiful ore reserves of a high quality, although heavy transportation costs and the cost of energy in use made the mining of anything but the higher grades impossible.¹⁰⁸

The Paley Report anticipated that free world demand for asbestos would increase by 43% between 1950 and 1975. Between 1950 and 1955, however, Canada's exports of unmanufactured asbestos increased by 21% in volume. The United States Bureau of Mines study offered no exact projection of consumption but would appear to be relatively optimistic, especially for consumption of Canadian asbestos. Mr. Penhale has suggested that Canada's exports might increase by 80% between 1955 and 1980, although he indicated that his optimism must be tempered by the possibility of asbestos from other sources, substitutes and synthetics. If these exports were valued at 1955 average values, this would mean exports in 1980 amounting to about \$175 million. The past has seen a tendency for a more rapid growth in exports of asbestos waste, refuse or shorts, the least valuable of Canada's various asbestos exports. On the other hand, developments in British Columbia should make possible increasing exports of long-fibre, low-iron asbestos and it is also possible that asbestos manufactures may make up an increasing, although still small, proportion of Canada's exports. Further, asbestos prices have risen between 1955 and 1956, more than offsetting the small (2%) decline in production between the two years.¹⁰⁹ In the light of these considerations, Canada's exports of asbestos and products are projected as rising from \$84 million in 1954 and \$98 million in 1955 to \$175 million in 1980, distributed about as in recent years. This forecast could be upset by the development of cheap substitutes or synthetic asbestos, or, if demand continues to grow at something like recent rates, it could prove to be too low.

¹⁰⁷ *The Financial Post*, Toronto, July 14, 1956, and January 7, 1957; and *The Gazette*, Montreal, July 16, 1956, and January 3, 1957.

¹⁰⁸ Mining Association of British Columbia, *Submission to the Royal Commission on Canada's Economic Prospects*, December 31, 1955, p. 12.

¹⁰⁹ D.B.S., *Preliminary Estimate of Canada's Mineral Production, 1956*.

13. *Petroleum and Products*¹¹⁰

(a) *General Export Position*

In 1937-38, Canada had virtually no domestic exports of crude oil. Exports of petroleum products averaged only slightly more than \$1 million, with somewhat over half going to Newfoundland. After the war, petroleum and products exports reached a temporary peak of \$9.3 million in 1948. Of this amount, \$5.2 million went to Newfoundland and \$1.2 million to the United States. Crude oil exports were valued at less than \$3,000 and disappeared completely in the next two years. Beginning with 1951, however, exports of crude oil to the United States have become important and total exports of petroleum and petroleum products have grown rapidly. From \$300,000 in 1950, they rose to \$9 million in 1954, to \$40 million in 1955, and to \$94 million in the first 10 months of 1956. Of this last amount, \$84 million consisted of crude oil, \$300,000 to Japan and the balance to the United States.

In 1955, 98.9% of the \$39.9 million of total exports of petroleum and products went to the United States, 0.6% to St. Pierre and Miquelon, 0.4% to Brazil, and only 0.1% to all other markets. Of the \$39.5 million to the United States, almost 92% was in the form of crude oil, almost 5% was gasoline and naphtha, and over 3% fuel oil.

Petroleum and products have long been important among Canada's imports and from 1947 to 1951 were the most important commodity under the Bank of Canada's import classification. These imports have risen in the postwar period but the rise, particularly since 1948, has been less rapid than the rise in total imports. Nevertheless, total 1955 imports of \$374 million were more than nine times total exports.

(b) *Canadian Production*

As a result of the discovery of new oil fields in Alberta and of the increase in production there, and to a less extent in Saskatchewan and Manitoba, Canada's crude oil production has grown from seven million barrels in 1947 to 129 million barrels in 1955.¹¹¹ Of the 1955 total, almost 88% came from Alberta, almost 9% from Saskatchewan and 3% from Manitoba. In the late 1940's, Canadian oil production lagged behind discoveries, so that the production of crude oil fell from 4.8% of proven year-end reserves in 1947 to 2.3% in 1948 and 1949. By 1955, however, the ratio had risen to 5.1%.¹¹²

¹¹⁰ In this section it is assumed that Middle Eastern oil will, after the present interruption, become available, particularly to Western Europe, in the quantities and under the conditions which might have been expected in the first half of 1956. If this should not be the case, however, the requirements for Canadian oil might be considerably increased. On Western Europe's future oil requirements see *Oil: The Outlook for Europe*, a study by the Oil Committee, Organisation for European Economic Co-operation, Paris, September 1956.

¹¹¹ Production rose further in 1956, to about 170 million barrels (D.B.S., *Preliminary Estimate of Canada's Mineral Production, 1956*). During 1956 British Columbia became a producing province as a result of developments in the Fort St. John area (*The Financial Post*, Toronto, September 29, 1956).

¹¹² Bank of Canada, *Statistical Summary*, August 1956. When the *Paley Report* was written, production of crude oil in the United States was 7% to 8% of proven reserves (Vol. III, p. 11).

While Canadian consumption of petroleum products more than doubled between 1947 and 1955, Canadian production of crude oil rose from 7% of domestic consumption to 56%. Most Canadian output has, in fact, gone into domestic consumption. In 1954 exports accounted for only 3% of production and, in 1955, 14% of production was exported.¹¹³

(c) *Canada's Place in World Production and Trade*

The publication *World Oil* has estimated that in 1955 the United States accounted for 44% of the world's crude oil production. Venezuela produced 14% of the total, other countries in the Western Hemisphere 6%, the countries in the Persian Gulf area 21%, the U.S.S.R. and Eastern Europe 11%, and other countries in the Eastern Hemisphere 4%. Within the other countries of the Western Hemisphere, Canada accounted for 2.25% of the world total. From 1947 to 1955, world production of crude oil increased by 84% while that in the United States rose by only 33%. The greatest absolute increase occurred in the Persian Gulf area (Bahrein, Iran, Iraq, Kuwait, Qatar and Saudi Arabia) where production increased by 280% from 10% to 21% of the world total. Production in the U.S.S.R. and Eastern Europe (including Austria but accounted for mostly by the U.S.S.R.) increased by 161%.¹¹⁴

On the basis of 1955 data published by the United Nations, the United States, despite its vast production, was the world's largest importer of petroleum and products. United States imports of over US\$ 1 billion were followed by those of the United Kingdom at \$940 million. France was in third place with about \$570 million and Canada fourth with \$375 million. Middle Eastern sources dominated the important markets in the United Kingdom and Western Europe, while the United States relied on the Caribbean area for 59% of its imports of crude and partly refined petroleum and for 61% of its imports of products.¹¹⁵

United States imports of crude oil exceeded exports in every year from 1946 to 1955 and, since 1950, the same was true for petroleum products. In 1955, United States imports of crude oil were 285 million barrels, while imports of refined products were 169 million barrels and total net imports amounted to 319 million barrels. It has been estimated that the total United States demand for petroleum products in 1955 was 3,183 million barrels, 3,048 million domestic demand and 135 million exports. As stocks rose by 6.5 million barrels, the total new supply was 3,189.5 million barrels. Of this supply, 86% came from domestic production of crude oil and other oils and 14% was imported (9% as crude oil and 5% as refined products).¹¹⁶

¹¹³ Bank of Canada, *op. cit.*

¹¹⁴ *World Oil*, February 15, 1956, p. 186; and Bank of Canada, *op. cit.*

¹¹⁵ United Nations, *Commodity Trade Statistics*, January-December 1955. The listing in the text excludes the heavy imports of Venezuelan oil for refining in the Netherlands Antilles.

¹¹⁶ Data from the U.S. Bureau of Mines published in *World Oil*, February 15, 1956, pp. 76 and 80-83.

As noted, the United States obtained most of its 1955 petroleum imports from the Caribbean area. United States trade data show imports of 467 million barrels of petroleum and products valued at \$1,024 million. If paraffin, paraffin wax, petroleum jelly and asphalt are added, the value was \$1,032 million. Of these imports, 44.5% by volume and 47% by value came from Venezuela. Next in importance was the Netherlands Antilles with 21% of the total volume, followed by Kuwait (12%), Saudi Arabia (6%), Mexico, Canada, Indonesia, Colombia, Iraq and Arabia. Canada provided 3.6% of the total volume and 4.3% of the value, as compared with 0.7% and 1.0% in 1954. Of the total imports of crude oil, Canada's share was 5.5% by volume and 6.3% by value in 1955.

An article in the *Survey of Current Business* has noted that, during the 1948-49 period of adjustment in United States business activity, the demand for petroleum remained stable and imports increased, so that part of the decline in imports of most other types of raw materials was offset. From 1953 to 1954, United States consumption of petroleum increased and oil imports were maintained, although imports of a number of other industrial materials again declined. By the first half of 1955, imports of petroleum and products had reached 9% of total United States imports of all commodities.¹¹⁷

(d) *Market Outlook*

In the Paley Report study on oil, which appeared as Chapter 1 of Volume III, a vigorous growth in the free world's demand for oil products was expected.¹¹⁸

Between 1950 and 1975, United States consumption of petroleum products was expected to increase by 110%. This increase was slower than in the past, but the number of passenger cars was expected to increase more slowly and they were projected to consume only about 75% more fuel in 1975. With a stringent supply situation in 1975 consumption could be less; with technical advances it could be greater. A forced shift away from liquid fuels would be particularly difficult in transportation. This, however, need never occur. After United States crude, foreign crude was available and recourse could be had to synthetics produced from oil shale and coal, of which the United States had large supplies.

In 1950 the rest of the free world consumed only a little more than half as much oil as did the United States and its consumption could be expected to increase more rapidly than that in the United States. Thus an increase by 275% was projected for 1975. Adequate supplies of crude oil should be available to meet this increased consumption. While United States produc-

¹¹⁷ Marie T. Bradshaw, Daniel Roxon and Max Lechter, "Imports and Domestic Business", *Survey of Current Business*, U.S. Department of Commerce, November 1955, pp. 18-20.

¹¹⁸ In addition to the chapter cited in the text, oil is considered elsewhere in the *Paley Report*. See especially Vol. I, pp. 107-111; Vol. II, pp. 129, 165-169, and 198-199; Vol. IV, pp. 16-17, 171-178, and 193-212; and Vol. V, pp. 99-106.

See also U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 601-680.

tion in 1950 was 8% of known reserves, that of the rest of the free world was only 3.2%.¹¹⁹ The Middle East and Venezuela could greatly increase their production; Canadian production might soon support net exports.

The Paley Report suggested that a hypothetical balance sheet of 1975 world oil supplies might look something like that presented in the following table. This pattern would involve United States net imports increasing to almost five times their 1950 level. Exports from the rest of the Western Hemisphere, however, were not expected to keep pace with United States imports, so that in 1975 about half of the United States deficit would be covered by net imports from the Eastern Hemisphere.

World production and consumption of petroleum products have increased greatly since the Paley Report was written. Between 1950 and 1955, crude oil production grew from 10.4 million barrels to 15.3 million barrels per day. Outside the Soviet bloc, 1955 crude oil production was 13.7 million barrels daily, up 41% from production of 9.7 million barrels in 1950. Meanwhile, United States demand reached 8.4 million barrels per day in 1955.¹²⁰

***Hypothetical Pattern of Free World Oil Supplies and
Demand in 1975 Compared with 1950***

(millions of barrels per day)

Region	Production		Apparent consumption		Net imports— Net exports+	
	1950	1975	1950	1975	1950	1975
United States.....	5.9	11.2 (a)	6.4	13.7	—0.5	—2.5
Other Western Hemisphere.....	2.0	5.9	1.2	4.6	+0.8	+1.3
Total Western Hemisphere.....	7.9	17.1	7.6	18.3	+0.3	—1.2
Europe.....	0.1	0.3 (a)	1.2	4.0	—1.1	—3.7
Middle East and other Eastern Hemisphere.....	2.0	9.4	1.1	4.5	+0.9	+4.9
Total Eastern Hemisphere.....	2.1	9.7	2.3	8.5	—0.2	+1.2
Free world excluding U.S.....	4.1	15.6	3.5	13.1	+0.6	+2.5
Total free world....	10.0	26.8	9.9	26.8	+0.1	—

(a) Crude oil, natural gas liquids, shale oil and other synthetics.

SOURCE: *Paley Report*, Vol. III, p. 10. The 1950 data were from the U.S. Bureau of Mines.

¹¹⁹ *Paley Report*, Vol. I, p. xii. More recently it has been noted that 87% of U.S. wildcat drilling in recent years had resulted in dry holes (*World Oil*, February 15, 1956, p. 109).

¹²⁰ *World Oil*, February 15, 1956, pp. 76 and 186–189.

A more recent study published by the Petroleum Department of the Chase Manhattan Bank suggested that, for both the United States and the rest of the free world as a whole, the Paley targets for consumption in 1975 would have been almost reached by 1965. It further suggested that United States net imports in 1965 would exceed the Paley projections for 1975. The approach employed in the study yielded some 20 different estimates, from which a selection of plausible demand figures was made. On this basis, it was anticipated that, from 1955 to 1965, United States oil consumption would rise 53% to 12.8 million barrels daily. Consumption in the rest of the free world was expected to rise 103% to 12 million barrels daily.¹²¹

While the study suggested that there were ample proved oil reserves in the world to meet the anticipated needs of the next decade, these reserves were unequally distributed relative to the areas of greatest consumption. In the Middle East, the United States (offshore), Canada and a few other

Table 7

**CALCULATION OF FREE FOREIGN WORLD CRUDE OIL
PRODUCTION REQUIRED TO BALANCE TOTAL DEMAND**
(thousand barrels a day)

	1950	1955	1960	1965
United States				
Domestic use.....	6,507	8,380	10,300	12,800
Exports.....	305	365	275	200
Total demand.....	6,812	8,745	10,575	13,000
Inventory change.....	- 56	- 17	+ 75	+ 75
Production — crude oil.....	5,407	6,775	7,860	8,700
nat. gas liquids.....	499	720	1,010	1,170
Total production.....	5,906	7,495	8,870	9,870
Excess requirements over production.....	850	1,233	1,780	3,205
Free foreign				
Domestic use.....	3,578	5,900	8,400	12,000
Exports.....	850	1,233	1,780	3,205
Total demand.....	4,428	7,133	10,180	15,205
Inventory change.....	—	+ 162	+ 75	+ 75
Imports from U.S.....	305	365	275	200
Other sources (a).....	—	100	200	400
Required crude oil production to meet demand.....	4,123	6,830	9,780	14,680

(a) Includes production of synthetics and natural gas liquids and imports from Soviet-controlled countries.

SOURCE: Joseph E. Pogue and Kenneth E. Hill, *Future Growth and Financial Requirements of the World Petroleum Industry*, Petroleum Department, the Chase Manhattan Bank, New York, February 21, 1956, p. 28.

¹²¹ Joseph E. Pogue and Kenneth E. Hill, *Future Growth and Financial Requirements of the World Petroleum Industry*, Petroleum Department, the Chase Manhattan Bank, New York, prepared for presentation at the Annual Meeting of the American Institute of Mining, Metallurgical and Petroleum Engineers, Petroleum Branch, February 21, 1956. In the introduction to the study, it was noted that the objectives sought were not specific forecasts as such, but rather growth patterns from which practical deductions might be drawn.

areas, reserves were large in respect to requirements and output could be increased freely by drilling more wells. On the other hand, in the United States (onshore), Venezuela and most small-producing countries of the world, the ratio of reserves to needs was moderate and output would have to be more closely attuned to the rate of discovery of new oil.

Various approaches suggested the result that, from 1955 to 1965, United States production of crude oil and natural gas liquids would rise 32% to 9.9 million barrels daily. If the rest of the free world was to supply its own net requirements and the net import requirements of the United States, its production would have to increase by 115% to 14.7 million barrels daily. These estimates and the calculations leading up to them are presented in Table 7. There it is indicated that, perhaps except for the possibility of synthetics, United States net imports were expected to rise from less than one million barrels daily in 1955 to three million barrels daily in 1965. In the study's consideration of the sources of supply to meet the requirements which have been indicated, the Middle East became the balancing factor in equating world supply and demand. Canada appeared as the fastest growing major supplier of crude oil with production almost tripling between 1955 and 1965 when it was estimated at a million barrels daily.

The Commission received a number of valuable briefs from the Canadian oil industry.¹²² Of these, the carefully worked out presentation by Imperial Oil Limited was generally the most optimistic on exports and Canadian production. At the outset, the Imperial Brief emphasized that its purpose was solely to outline the broad course which might be anticipated for the Canadian petroleum industry, under assumed conditions, rather than to provide specific forecasts of future economic activity. On the basis of a 1980 G.N.P. in excess of \$60 billion (1955 dollars) and a population of 24.5 million, Canadian requirements for petroleum were seen as growing from 623,000 barrels daily in 1955 to 1,753,000 barrels daily in 1980.¹²³ The substantial volume of crude oil required to supply Canadian refineries would be

¹²² Canadian Petroleum Association, *A Submission to the Royal Commission on Canada's Economic Future with respect to the Potential Development of the Oil and Gas Industry in Canada*, filed November 18, 1955, for Hearing November 24, 1955;

Brief Presented by Bailey Selburn Oil and Gas Ltd. before the Royal Commission on Canada's Economic Prospects, Toronto, January 26, 1956 (the brief was presented to the Commission in Ottawa on March 6, 1956);

M. S. Beringer, President, the British American Oil Company Limited, Toronto, *A Submission to the Royal Commission on Canada's Economic Prospects*, January 23, 1956;

The California Standard Company, *Submission to the Royal Commission on Canada's Economic Prospects*;

E. D. Loughney, Vice-President, Canadian Gulf Oil Company, Calgary, *A Submission to the Royal Commission on Canada's Economic Prospects*, November 24, 1955;

Glenn E. Nielson, President of Husky Oil and Refining Ltd., *Statement before the Royal Commission on Canada's Economic Prospects*, Calgary, November 25, 1955;

Imperial Oil Limited, *Prospects for Canada's Oil Industry, 1955-1980*, December 1955; and

W. M. V. Ash, President, Shell Oil Company of Canada, Limited, *Petroleum in Canada's Economy. A Submission to the Royal Commission on Canada's Economic Prospects*, January 30, 1956.

¹²³ The Commission's forecasts are for a G.N.P. of \$76 billion and a population of 26.65 million. The Canadian Petroleum Association's brief put Canadian demand in 1980 at 1,762,000 barrels a day, while that of the British American Oil Company suggested 2,082,000 bbls. daily.

predominantly from domestic crude oil production, although some imports would continue to be required.¹²⁴ Calculations were based on supplying Canadian crude to existing markets through 1960, with Montreal refineries included by 1980.

Crude oil exports, which were expected to approximate 52,000 barrels daily in 1955, might reach 175,000 barrels daily by 1960 with further expansion in those markets being served by Canadian oil.¹²⁵ These markets — the Lakehead/Minneapolis area and the Puget Sound area — might require at least 600,000 barrels daily by 1980 and possibly more. If crude oil deficiencies of the order anticipated in the Paley Report were to develop before the end of the period, Canada might reasonably expect to export up to a million barrels per day of additional crude. As indicated in the following table, these various possibilities lead to a required Canadian production of crude oil and natural gas liquids of 352,000 barrels daily in 1955, 605,000 barrels daily in 1960 and from two million to three million barrels daily in 1980.¹²⁶

Canadian Crude and Product Supply and Demand
(thousands of barrels daily)

	1955	1960	1980	
			Case A	Case B
Crude production.....	359 (a)	598 (b)	2,000	3,000
Crude imports.....	226	260	110	110
Product imports.....	93	125	253	253
Crude exports.....	55	175	610	1,610
Crude and product demand	623	808	1,753	1,753

(a) Includes 7,000 b/d withdrawal from inventory.

(b) Excludes 7,000 b/d of surplus field plant production.

SOURCE: Imperial Oil Limited, *Prospects for Canada's Oil Industry, 1955-1980*, December 1955, p. 14.

The next question raised in the Imperial Oil Brief concerned the possibility of Canada producing crude oil in the magnitude indicated in the above table. In the light of various considerations, two projections of reserves were made: Case A, based on current proven reserves of three billion barrels, and Case B on proven and probable reserves, totalling 4.5 billion barrels.¹²⁷ These estimates indicated that, by 1980, 23.6 billion barrels would have been found in Case A and 30.4 billion barrels in Case B. Taking into account the two projected producing rates in the preceding table, this meant that remaining

¹²⁴ Imports of certain products, predominantly heavy fuel oil in the later years, would also be required.

¹²⁵ The trade statistics show that in 1955 crude oil exports reached only about 41,000 barrels daily. In the first ten months of 1956, however, they rose to 114,000 barrels daily.

¹²⁶ In contrast to the export surplus foreseen here for 1980, the Canadian Petroleum Association expected the import gap to remain almost unchanged and the British American Oil Company appeared to assume little more than net self-sufficiency.

¹²⁷ At the end of 1955, proven reserves were 2,510 million barrels of crude oil and 247 million barrels of natural gas liquids (Bank of Canada, *op. cit.*).

reserves would amount to 13.3 billion barrels for Case A and 17.4 billion barrels for Case B.¹²⁸ Comparisons with the oil finding history in the United States and other oil producing regions indicated that such volumes of oil were quite reasonable. The estimates are summarized in the following table.

Production, Producibility and Reserves

	Production M b/d	Producibility M b/d	Prod. as % of producibility	Year end remaining reserves MM bbls.
1955.....	352	655	54	3,000
1960.....	605	1,380	44	6,600
1980..... Case A	2,000	2,800	71	13,300
Case B	3,000	3,800	79	17,400

SOURCE: Imperial Oil Limited, *Prospects for Canada's Oil Industry, 1955-1980*, December 1955, p. 17.

During the 1960's, it was felt likely that there would be a substantial excess of potential over actual production. This problem of excess capacity in the mid-term might act as a deterrent to increased exploration activity to the extent that Case B might be difficult to approach by 1980. However, pressures of competition and the favourable circumstances existing suggested that the present level of activity was reasonable and that a modest rate of growth could be expected in spite of short-run adversities. It was assumed that activity would start to increase more rapidly as soon as more favourable markets appeared on the horizon, and that the expansion might take place a year or two before being really justified by the size of the market. This would have a tendency to prolong the excess producibility but also would provide the capacity required for the more rapid expansion anticipated in the 1970's.

The figures discussed in the Imperial Oil Brief did not include the reserves in the McMurray Tar Sands deposit which had been variously estimated at from 100 billion to 300 billion barrels. The development of these reserves posed some very difficult technical problems and both the location and the quality of the oil had been major deterrents to development.¹²⁹ Recently, however, Royalite Oil Co. Ltd. announced plans for the spending of \$50 million on development of these resources.¹³⁰

The Imperial Oil Brief forecasts crude oil exports rising to 610,000 barrels daily in 1980, assuming oil flows only to existing markets, or to 1,610,000 barrels daily, assuming a larger share in supplying the United States petro-

¹²⁸ The brief of the Canadian Petroleum Association forecast liquid hydrocarbon reserves in 1980 at 10.8 billion barrels of which 8.6 billion would be crude oil, while that of the Canadian Gulf Oil Company expected remaining reserves of crude oil and natural gas liquids to rise to 9.5 billion barrels in 1980.

¹²⁹ See also *The Athabasca Oil Sands*, a Submission to the Commission by S. M. Blair; and Government of the Province of Alberta, *Alberta's Economic Prospects* (revision of the Brief to the Commission), Edmonton, December 1955, pp. 137-143.

¹³⁰ *The Gazette*, Montreal, January 14, 1957.

leum deficiency. At 1955 unit values (Can. \$2.44 per barrel) this would mean exports valued at \$544 million or at \$1,436 million, not allowing for additional exports of petroleum products or for the fact that some of the exports taken into account might be in the form of the higher priced products.¹³¹

Assuming, as Imperial Oil would appear to believe, that this crude oil, plus the amount needed to satisfy Canadian demands not met by imports, can be produced in Canada, the basic question becomes how much the United States will be prepared to take. Forecasts examined earlier in this section point to a United States oil deficit of far greater magnitude than the projected Canadian exports, and the Commission's study, *Canadian Energy Prospects*, suggests that United States demand (and Canadian export supply) can safely be projected at something like 1.6 million barrels daily. The desire to get this oil from nearby sources for security reasons is already strong and will be further strengthened if difficulties continue in the Middle East. Recent United States restrictionist action may delay developments but, unless there is a large shift to synthetics, this could hardly have significant long-run effects in holding down Canadian shipments. Nor is the United States tariff of 10.5c. a barrel on most Canadian crude expected to interfere with the achievement of these results.

It would thus seem that results in 1980 might be close to the second case presented by Imperial Oil Limited, a conclusion also reached after the lengthy analysis in the Commission's energy study.¹³² At the 1955 export price, 1.6 million barrels daily would mean annual exports of \$1,425 million. Adding a conservative allowance for exports of petroleum products, which yielded \$3.7 million in 1955, the projection for exports of petroleum and products in 1980 is offered here at \$1,450 million. These exports are valued at the point of lading which is the entrance to the pipeline, so that, in addition, there will be a great increase in the earnings of the carriers.¹³³

14. Natural Gas

(a) General Export Position

Although a special United States permit has allowed natural gas to be piped from Alberta to a copper smelter in Montana since 1952, Canada's trade statistics do not at present show separate data on these exports. United States trade data, however, show imports of natural gas from Canada amounting to 7.7 billion cubic feet and US\$ 913,000 in 1954 and to 10.9 billion cubic feet and \$1.3 million in 1955. For the future, arrangements have been made for the export of natural gas to the United States Pacific

¹³¹ No account is taken of the increase of 18c. a barrel in the wellhead price announced by Imperial Oil Limited in January 1957 (*The Ottawa Journal*, January 16, 1957).

¹³² The Imperial brief (on p. 17) states that the first case "is regarded as a conservative projection of probable minimum demand".

¹³³ See Part A, Chap. 4, Section III (b) of this study.

Northwest and, as is well known, the question of the export of Alberta gas at Emerson, Manitoba, is before the United States Federal Power Commission.¹³⁴

(b) *Canadian Production and Reserves*

Associated with the oil developments in the West, Canada's production of natural gas has increased rapidly in the postwar period. In 1945 and in 1946, 48 billion cubic feet of natural gas were produced. By 1955, the figure had risen to 151 billion cubic feet and in 1956 it was 173 billion. Of the 1955 total, 88% was produced in Alberta, 7.5% in Ontario and about 4.5% in Saskatchewan. Minor amounts were also produced in New Brunswick and the Northwest Territories.¹³⁵

As presently known, Canada's major gas reserves are located in the Province of Alberta. Substantial reserves, however, also exist in the Peace River district of Alberta and British Columbia and a pipeline is being built to move this gas to the Pacific Northwest. Gas also occurs elsewhere in the country. What has been described as a major find has occurred in British Columbia north of the Peace River, and it has been reported that some success was achieved from offshore drilling in the Ontario waters of Lake Erie, Lake St. Clair and Lake Huron in the summer of 1956.¹³⁶

The problems of the estimation of gas reserves and the magnitude of the amount in various estimates need not be spelled out in this study. Estimates were suggested in the briefs to the Commission by the Provinces of Alberta and British Columbia and the vice-president of Canadian Gulf Oil Company.¹³⁷ The matter is reviewed in the Commission's energy study which takes a more optimistic view of the size of remaining marketable reserves in 1980, suggesting that they will be sufficient to support annual marketed production of three trillion cubic feet for 25 years, allowing for a growth of 4% per annum with respect to two trillion cubic feet of this production.¹³⁸

(c) *Market Outlook*

In the Paley Report, it was stated that it was expected that new discoveries of natural gas in the United States would run at about 6,000 cubic feet of recoverable gas per barrel of recoverable oil. While substantial imports of natural gas might eventually come in from Canada and Mexico, these were likely to be small relative to the total future United States demand. Existing

¹³⁴ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 665; Government of the Province of Alberta, *op. cit.*, pp. 117-118; and Canadian and U.S. trade data.

¹³⁵ D.B.S., *Crude Petroleum and Natural Gas Industry, 1954*; *Crude Petroleum, Natural Gas and Manufactured Gas*, December 1955; and *Preliminary Estimate of Canada's Mineral Production, 1956*. Production data do not include waste gas burned in the field.

¹³⁶ *The Financial Post*, Toronto, March 31, April 28, and August 25, 1956.

¹³⁷ Government of the Province of Alberta, *op. cit.*, pp. 116-119; Government of the Province of British Columbia, *Documentary Submission to the Royal Commission on Canada's Economic Prospects*, Victoria, August 1, 1956, p. 32; and E. D. Loughney, *op. cit.*

¹³⁸ John Davis, *Canadian Energy Prospects*, Chap. 4, fourth section.

and currently prospective costs of deriving gas from coal were so high that the processes did not promise to be economic for any but very high-grade special uses, such as household cooking. Improved methods of obtaining gas from coal were being sought, however, and the prospects might be considerably improved by 1975. Even if long-run petroleum output settled down to 2.5 billion barrels a year, natural gas production might in the meantime reach a peak of say 18 trillion to 20 trillion cubic feet and then gradually decline to the long-term level of 15 trillion, later to fall off from that level as domestic petroleum production fell off from the 2.5 billion barrel annual level. How much gas would be consumed would depend fundamentally on the available supplies and more immediately on the price structure likely to result from the relation of those available supplies to future demand. The Report, nevertheless, offered the projection that the consumption of natural gas would increase by 138% from 6.3 trillion cubic feet in 1950 to 15 trillion feet in 1975. Because of the responsiveness of the undifferentiated energy markets to price differentials, this projection was stated to be subject to a particularly wide margin of error.¹³⁹

According to the more recent study by the United States Bureau of Mines, future consumption and production of natural gas would depend largely upon the success of future exploration in providing adequate supplies. The United States economy in 1975 should easily find use for twice as much natural gas as was consumed in 1950.¹⁴⁰

Export prospects for Canadian natural gas may be considered in terms of three potential market areas. These are the United States Pacific Northwest, the Rocky Mountain area and the Middle West (the area south and west of the Great Lakes). With respect to the Pacific Northwest, the submission to the Commission by the Government of British Columbia stated that the first pipeline of the Westcoast Transmission Company, to be completed by November 1957, would have a capacity of 660 million cubic feet a day at full capacity, with 300 million cubic feet or 110 billion cubic feet a year (at 90% load factor) destined to the United States. By 1960, it was stated, actual demand might be sufficient to justify a second 30-inch pipeline to the international border.¹⁴¹ In the Commission's energy study it is stated that the Pacific Northwest is potentially perhaps the best single outlet for Canada's surplus gas. By the mid-1960's, sales to Washington and Oregon might reach 250 billion cubic feet a year.

For the United States Rocky Mountain area, the energy study states that exports from Alberta, which now exceed 10 billion cubic feet a year, are expected to reach a total of 20 billion cubic feet annually by 1957 or 1958. For 1965, these exports are projected at 30 billion feet.

¹³⁹ *Paley Report*, Vol. III, pp. 20-21 and 23; and Vol. II, pp. 118 and 130. Natural gas also received attention at many other points in the Report.

¹⁴⁰ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 674.

¹⁴¹ Government of the Province of British Columbia, *op. cit.*, pp. 32-33.

As regards the United States Middle West, Tennessee Gas Transmission Company is seeking the United States Federal Power Commission's permission to import 200 million cubic feet of gas daily (73 billion feet per year) at Emerson, Manitoba, for 25 years. Tennessee is also seeking the export from Canada of a further 100 million cubic feet daily near Niagara Falls, reducible to no export at the option of Trans-Canada Pipelines Limited and associated with the import near Niagara Falls of up to 90 million cubic feet daily for the period until Alberta gas is available in central Canada.¹⁴² In January 1956, the president of Tennessee was reported to have stated that the unfilled or potential market for natural gas in the United States Midwest (Minnesota-Wisconsin, Chicago area, New England and New York) would by 1961 aggregate 410 billion cubic feet per year.¹⁴³ If half of this market were supplied by Canadian gas, this would mean exports greater than those which have been suggested. It is, however, as yet uncertain whether there will be United States approval for the present request to import Canadian gas into the Middle West. It has been suggested by a vice-president of Trans-Canada that larger Canadian markets than had been anticipated had given the company an opportunity to finance its operations on Canadian sales alone.¹⁴⁴ In September 1956, however, the company was reported to have said it would continue with plans for the export of gas.¹⁴⁵ In the Commission's energy study it is suggested that, exclusive of any allowance for supplementary sales in Michigan and Illinois, it is quite possible that exports in this area might approach 150 billion cubic feet annually by the mid-1960's.

The difficulty of arriving at an over-all projection for Canada's exports of natural gas need hardly be stressed. The material referred to above suggests that over the next ten years or so exports might reach 400 billion to 500 billion cubic feet annually, although this range cannot be regarded as providing the outside limits.

To estimate export demand in 1980, the Commission's energy study assumes that Canadian natural gas would be in demand to the extent of some two-thirds of the growth requirements of the United States Pacific Northwest after 1958; all of the supplementary requirements of Montana after 1955; one-third of the incremental demands of the Middle West, including Michigan but not Illinois, etc., after 1960; one-quarter of the growth requirements of Ohio, northern New York and New England after 1965; and one-quarter of the growth requirements of California after 1965. This adds up to some 3.5 trillion cubic feet a year by 1980, an amount substantially above that likely to be available.¹⁴⁶ Canadian requirements of about two trillion

¹⁴² Statement by the Minister of Trade and Commerce in the House of Commons, *House of Commons Debates, Official Report*, Thursday, March 15, 1956, p. 2165.

¹⁴³ *The Financial Post*, Toronto, January 7, 1956.

¹⁴⁴ *The Gazette*, Montreal, June 28, 1956.

¹⁴⁵ *The Gazette*, Montreal, September 20, 1956.

¹⁴⁶ A possible limitation to Canadian exports might result from the intense exploration for gas in the Williston Basin of North Dakota and elsewhere in the United States.

cubic feet in 1980 are anticipated, and exports of around one trillion cubic feet annually are assumed. With remaining reserves at the level suggested, these exports could last for 25 years, while Canadian sales grew 4% per annum over that period.

The forecast of exports of a trillion cubic feet depends on many factors. It involves the finding of vast quantities of gas. It involves Canadian provincial and federal policy letting gas out of the country and United States policy accepting it. Since the technique in the present study is, for presentational purposes, to avoid the use of ranges (although, in fact, ranges are implied) a figure must be selected. If a trillion cubic feet be chosen, this might be valued at 15c. to 20c. per thousand feet at the field (wellhead price plus gathering charges). The exports in the trade data would be valued at such a price, with about an equal value appearing as freight receipts in the balance of payments. This would mean exports in 1980 valued at \$150 million to \$200 million, say \$175 million. From what has already been said and from the Commission's energy study, it will be apparent that little confidence can be placed in any figure which might be selected.

It should finally be noted that the production of natural gas will be associated with the production of sulphur and natural gas liquids. The export of these commodities, or of commodities made from them, may also be of importance in Canada's trade in 1980. These exports, however, are taken into account elsewhere.

15. Other Non-metallic Minerals and their Products

In addition to asbestos, petroleum and natural gas, Canada's domestic exports of other non-metallic minerals and their products were valued at \$52 million in 1954 and \$67 million in 1955. Crude artificial abrasives accounted for 52% of this export value in 1954 and for 40% in 1955, but no other commodity bulked very large in the total export picture. The composition of the group is shown by the table on the following page. Between the first ten months of 1955 and the same period in 1956, exports (including natural gas) rose in value from \$56.2 million to \$60.6 million. The largest change was an increase in crude gypsum or plaster from \$4.0 million to \$6.1 million.

With natural *abrasives* and abrasives manufactures constituting only about \$500,000, the great bulk of Canada's domestic exports of abrasives is in the form of the crude artificial product, valued at about \$27 million in both 1954 and 1955. At somewhat over 250,000 tons in these years, the export volume was more than double that in 1937 when the value was less than \$7 million. In both 1954 and 1955, exports went almost entirely to two countries, with sales to the United Kingdom of about \$4 million and to the United States of about \$23 million. More detail as to the nature of these exports is obtainable from the United States import statistics, which show imports from Canada of silicon carbide at \$5 million in 1954 and \$8 million in 1955; aluminous abrasives, etc., at \$18 million in

*Canada's Domestic Exports of Other Non-metallic Minerals
and their Products (a)*

(thousands of Canadian dollars)

	1954	1955
Clay and products.....	2,223	2,654
Coal and coal products.....	4,357	7,843
Glass and glassware.....	1,368	2,706
Crude artificial abrasives.....	27,222	26,942
Other abrasives.....	560	519
Gypsum or plaster, crude.....	4,205	4,931
Portland cement.....	496	3,139
Barite.....	n.a.	2,275
Fluorspar.....	n.a.	1,461
Nepheline syenite.....	1,269	1,753
Carbon and graphite electrodes.....	1,251	2,946
Sulphur contained in pyrites.....	1,567	2,002
Sulphur n.o.p.....	90	94
Salt.....	26	1,001
Other (b).....	7,593	7,210
Total.....	52,227	67,476

(a) Excludes fertilizers, synthetic rubber and other chemicals.

(b) Excludes natural gas, estimated from U.S. data at 800 in 1954 and 1,100 in 1955.

1954 and \$14 million in 1955; and other crude artificial abrasives at \$80,000 in 1954 and \$110,000 in 1955. Canadian supplies constituted almost all United States imports in each of these three categories.

In the study by the United States Bureau of Mines, it was noted that since 1900 aluminum oxide and silicon carbide had largely superseded natural abrasives in wheels, but that some consumers still preferred corundum (a natural oxide of aluminum) for a few grinding operations. Corundum also continued to hold a place in the optical industry, particularly for lens grinding. Although Canada was once an important source of corundum, the most important supplier had become the Union of South Africa.¹⁴⁷ United States import data, however, show corundum imports as far less important than those of artificial abrasives.

Silicon carbides are produced by the fusing of sand and coke with sawdust, with salt as a flux. In the production of artificial alumina, bauxite is fused in an electric furnace. Canada may be expected to continue to be an important producer of both of these artificial abrasives. It would, however, seem unlikely that the export in crude form will be replaced by the export of manufactures, since the variety of forms in which abrasives are used would suggest that the Canadian scale of operations is unlikely to be large enough

¹⁴⁷ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 247-250.

to be economic. Recognizing that artificial abrasives must compete not only with natural corundum but also with industrial diamonds, Canada's exports may be projected as increasing approximately with United States G.N.P. This would mean exports in 1980 of some \$60 million or more.

The largest use of barium sulphate or *barite* is in oil-well drilling fluids in high pressure geologic formations, such as some of those in Texas, Louisiana and California. Thus, of Canada's exports of \$2.3 million in 1955, \$1.3 million went to the United States, \$0.5 million to Trinidad and \$0.4 million to Venezuela. Barite is also used in lithopone, an intimate mixture of zinc sulphide and barite, which is used as a white pigment, principally in paints. Barite is also used in the manufacture of glass and in manufacturing various barium chemicals.

The recent study by the United States Bureau of Mines noted that barium consumption doubled in the ten years prior to 1953, principally because of increased use in oil-well drilling fluids. The United States was potentially self-sufficient in barite but certain factors favoured its importation. The principal source of such imports was Nova Scotia where high-grade, easily worked deposits near tidewater could compete successfully with United States barite on the eastern seaboard and the Gulf coast despite a tariff of \$3 per long ton on a price of about \$13 a ton. The Bureau reported that several new plants had been built along the Gulf coast to grind imported barite. The trend in petroleum and natural gas drilling toward more wells and greater depths increased the possibilities of encountering high pressure formations with a consequent increase in the requirements for such a weighting agent as barite, and no other material so satisfactorily met the requirements. Large tonnages of barite might also be used as an aggregate in concrete shields in atomic power plants, as well as in military installations and shelters. The short-term reserve outlook for barite was regarded as satisfactory in the United States, but the long-range outlook might not be quite so favourable. With an anticipated annual requirement of at least 1.6 million tons by 1965 (apparent consumption was less than 1.3 million tons in 1953) known domestic reserves did not appear to be large. Chances of finding new deposits of barite or extensions of known deposits were considered to be good, but it would appear that substantially increased imports of Canadian barite into the United States might be expected.¹⁴⁸

Like barite, exports of *fluorspar* were first identified in the Canadian exports statistics in 1955. In that year exports amounted to \$1.5 million, entirely to the United States. According to the Paley Report, the growing demand for aluminum, plastics, ceramics, steel and other fluorspar-using products in the United States could, by 1975, be expected to increase the demand for fluorspar to nearly three times the 1950 consumption. Domestic reserves and likely discoveries, on the other hand, were not expected to support much more than a 10% increase in production at existing prices. As it

¹⁴⁸ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 87-93.

was felt that imports could not be relied on over the long run to close the gap between United States demand and domestic supply, it was also felt that the United States must expect to turn to another source of fluorine, namely phosphate rock. Certain obstacles needed to be overcome, but the projection for 1975 involved a very large expansion in fluorine production from phosphate rock, so that imports needed to grow only from 165,000 short tons in 1950 to 200,000 tons in 1975. Even this, however, would involve fluor spar production in the rest of the free world increasing to two and one-half times the level of 1950 (rather than to four and one-half times which would be required if the United States were unable to produce fluorine from phosphate rock). Expansion seemed feasible from existing reserves in Mexico, Newfoundland and Spain, but production might no more than double the level of 1950.¹⁴⁹

The more recent study by the United States Bureau of Mines was less optimistic about the production of fluorine from phosphate rock and thus would seem to suggest a growing level of trade in fluor spar. Although the United States was the world's largest fluor spar producer, imports exceeded domestic production in 1952 and 1953. About half of the imports came from Mexico and important tonnages were also received from Canada, Spain, Italy and Germany. Several domestic producers had voiced concern, however, over the increased volume of imports and attributed the current low rate of domestic output in large part to heavy competition from imported material. Thus the United States Tariff Commission had initiated a study on fluor spar. Fluor spar was subject to a duty of \$1.87½ per short ton for material containing over 97% fluorite. (Prices reached an all-time high of \$49.48 in 1953 but declined sharply in 1954.) The Bureau saw new and expanded uses of fluorine chemicals and increases in steel and aluminum production indicating a substantial upward trend during the next decade in fluor spar consumption in the United States. A long-range increase in domestic production of fluor spar might occur, but to a large degree future United States output was conditional on the quantity imported and the price structure. Recovery of fluorine from waste gases evolved in processing phosphate rock was limited at the time of writing by technologic and economic problems.¹⁵⁰

Canada would appear to have substantial quantities of fluor spar available and, despite the increases projected for Canadian production of aluminum and other uses of fluor spar, production in Newfoundland would appear to be capable of supporting increased exports. Even if there should be substantial progress in the recovery of fluorine from phosphate rock, it would appear that the demand for fluor spar will be such that a significant increase in exports should occur.

¹⁴⁹ *Paley Report*, Vol. II, pp. 88-91, 118, 132 and 145. In 1955 the U.S. imported 324,000 long tons of fluor spar. Of this amount Canada supplied only 35,000 long tons.

¹⁵⁰ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 279-290.

Of Canada's exports of *nepheline syenite* amounting to \$1.8 million in 1955, \$1.7 million went to the United States. According to United States trade statistics, virtually all United States imports of this commodity came from Canada. The United States Bureau of Mines noted that nepheline syenite was used as a substitute for feldspar in the manufacture of glass and pottery. American Nepheline Limited, Lakefield, Ontario, was the only producer of crude and ground nepheline syenite in the Western Hemisphere. Exports to the United States were all, or virtually all, in ground form and increased greatly from 1944 through 1953, owing mainly to increased use in the glass container industry which grew phenomenally over the period. The development of the ceramic industry, the high cost of transporting feldspar long distances and the prospect of diminishing domestic United States supplies of low-cost, high-grade potash feldspar had caused all branches of the United States ceramic industry to make a considerable effort to develop and use low-potash domestic feldspars and substitute materials. One of the substitutes was provided by imports of nepheline syenite; yet the Bureau of Mines stated that there were indications that future imports of nepheline syenite would not greatly exceed the 1953 level, unless its competitive position improved or there was an unexpectedly large increase in the demand for glass and other ceramic products.¹⁵¹ It may be noted that, from 1953 (the last year for which data are given in the Bureau of Mines study) to 1955, Canada's exports of nepheline syenite to the United States increased from 72,000 tons to 114,000 tons. A recent newspaper article noted that American Nepheline Limited had increased production from 400 to 600 tons daily and that expanding markets might bring another increase to 1,000 tons daily.¹⁵²

In 1955 Canada exported \$2 million worth of *sulphur* in pyrites, of which \$1.3 million went to the United States, plus \$94,000 of other sulphur.¹⁵³ For the future, Canada has vast sources of sulphur, including recovery from stack gases associated with smelting operations, recovery from pyrites and recovery from natural gas. In addition, the tar sands of northern Alberta constitute a huge potential source of sulphur. Twenty-five years hence, Canada will undoubtedly be in a position to export very large quantities of sulphur, in virtually whatever form desired, if there exists a market for such exports.

Between 1950 and 1975, the Paley Report expected that the consumption of sulphur would increase by 110%, both in the United States and in the rest of the free world. Most of the increase in United States use was expected to be in fertilizers and chemicals. Since the United States production of low-cost Frasch-process sulphur from salt-dome deposits was not expected to keep

¹⁵¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 263-271.

¹⁵² *The Financial Post*, Toronto, August 11, 1956. See also the *Post's* issue of September 22, 1956, where it was also stated that a second company had begun producing in the Peterborough area.

¹⁵³ In addition, exports of sulphuric acid were valued at \$550,000, almost entirely to the United States, and substantial exports of fertilizer were based upon the availability of sulphuric acid. Further, Canada's greatest exporter, the pulp and paper industry, required large quantities of sulphur.

pace with the growing demand, it was expected that by 1975 the United States might be securing the major portion of its sulphur from other than salt-dome deposits. In the absence of significant technological change, the real cost of sulphur might be 25% to 50% above the level at the time the Report was written. This would probably bring forth ample amounts of sulphur to supply the estimated United States demand well beyond 1975.¹⁵⁴

The sources examined are of relatively little assistance in developing a projection of Canada's exports of sulphur in the future. To some extent, however, it can be anticipated that exports of sulphur will increase merely as a result of availability in Canada. Further, increasing exports of metallic ores will presumably mean increasing exports of sulphur in pyrites (although this does not apply to iron ore from the Labrador-Quebec deposit).

Space does not permit as detailed comments on the remaining non-metallic minerals as were provided for the foregoing. Some of the characteristics of present exports may, however, be noted. The most important constituent of the \$2.7 million of exports of *clay and products* in 1955 was \$1.7 million of firebrick, of which \$1.0 million went to the United States. Of the \$7.8 million of exports of *coal and coal products* in 1955, \$4.8 million consisted of coal other than lignite. The size of this item was largely accounted for by increased exports to the United States amounting to \$2.6 million and by the appearance of exports to the United Kingdom at \$2.0 million in 1955. Also important in the coal and coal products group in 1955 were petroleum coke at \$1.3 million (\$0.5 million to the United Kingdom) and other coke at \$1.2 million (all to the United States). Common colourless window glass at \$2.1 million, almost entirely to the United States, was the major item in the 1955 exports of \$2.7 million of *glass and glassware*. The 1955 exports of \$4.9 million of *gypsum or crude plaster* and the \$3.1 million of *Portland cement* went almost entirely to the United States. The increase in exports of *carbon and graphite electrodes* from \$1.3 million in 1954 to \$2.9 million in 1955 was almost entirely explained by an increase in exports to the United Kingdom, to \$1.8 million. *Salt* exports, which increased from \$26,000 in 1954 to \$1.0 million in 1955, went almost entirely to the United States. The remaining *miscellaneous non-metallic minerals*, exports of which amounted to about \$7 million in 1955, went largely to the United States.

Exports of the non-metallic minerals and their products considered in this section amounted to \$52 million in 1954 and to \$67 million in 1955. For the largest item, crude artificial abrasives, it has been suggested that exports might increase from \$27 million in 1955 to \$60 million or more in 1980. As at least some items in this group may well increase considerably more rapidly, a faster rate of increase for the group as a whole is probably

¹⁵⁴ *Paley Report*, Vol. II, pp. 83-87, 118, 127 and 132. See also U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 843 and 850.

appropriate. Accordingly, 1980 exports are projected at \$175 million, about 160% above the 1955 value and 235% above 1954.

16. Aluminum and Products

(a) General Export Position

One of Canada's most important metal exports, aluminum, is based not upon the availability of the ore, all of which has to be imported, but upon cheap hydro-electric power. Domestic exports of unmanufactured aluminum (scrap, primary and semi-fabricated) rose in volume from a pre-depression peak of 38,000 tons in 1929, and 66,000 tons in 1938, to a wartime peak of 391,000 tons in 1945. After a brief postwar decline, they reached 537,000 tons in 1955. In value, exports of aluminum and its products were \$15 million in 1929, \$24 million in 1938, and have since grown to \$213 million in 1955.

The bulk of Canada's aluminum exports are in primary forms (bars, blocks, ingots and blooms) which accounted for almost 93% of the total value in 1955. Semi-fabricated aluminum (rods, sheets, circles, plates, and wire and cable) accounted for over 4%; scrap for about 2%; and aluminum manufactures for under 1%. Since the end of the war, there has been a tendency for exports of aluminum in primary forms to increase in relative importance — from 82% of the total value in 1947 to 93% in 1955.¹⁵⁵

In the late 1920's, the United States was Canada's most important market for unmanufactured aluminum. From 1931 to 1944 and in most of the postwar years, however, a larger volume has been shipped to the United Kingdom. In 1954, exports to the United States and the United Kingdom each amounted to about 211,000 tons while all other countries took 77,000 tons. In 1955, the United Kingdom took 259,000 tons, the United States 210,000 and other countries 68,000 tons. By value, exports of aluminum and its products in 1955 amounted to \$99 million to the United Kingdom, \$84 million to the United States and \$29 million to all other countries.¹⁵⁶

(b) Canadian Production

Canada's production of aluminum has increased enormously since pre-war, rising more than tenfold from 1937 to the wartime high established in 1943. Production declined after the war but soon began to rise again and, in 1955, was 23% above the 1943 level. Exports account for a very high percentage of Canadian aluminum production; in 1955 exports of scrap

¹⁵⁵ An increasing proportion of primary metal sales has been made in the form of rolling or extrusion ingots to customers' specification for size and alloy composition.

¹⁵⁶ Between the first ten months of 1955 and the same period of 1956, exports to the United Kingdom fell from \$81 million to \$79 million, while those to the United States rose from \$73 million to \$80 million, and total exports were about unchanged at \$179 million.

(including new scrap), primary and semi-fabricated aluminum were around 90% of primary production.¹⁵⁷

All Canadian production of primary aluminum is in the hands of the Aluminum Company of Canada, Limited (Alcan)—the principal subsidiary of Aluminium Limited. Alcan and Aluminium Limited have extensive interests in many countries. The capacity of Alcan's Canadian smelting plants at the end of 1955 was 650,000 tons per year or about 7% above 1955 production reported by the company. This capacity included 90,000 tons at the Kitimat plant which was placed in operation in August, 1954.¹⁵⁸

The company has embarked upon an expansion programme to raise Kitimat capacity to 180,000 tons by the end of 1956 and to 330,000 tons in 1959. The ultimate capacity of this project is 550,000 tons. In addition, 22,000 tons were being added to the capacity at Isle Maligne.¹⁵⁹ Press reports have stated that Alcan has also completed arrangements for a new power development which will mean construction of an additional 120,000 tons of aluminum smelting capacity in the Saguenay region, raising 1959 total capacity to over one million tons. Also involved would be the reduction of chances of a recurrence of a power shortage which, in the winter of 1955–56, caused primary production cutbacks of an estimated 65,000 tons.¹⁶⁰

A new development was the announcement that a subsidiary of the British Aluminium Company, Ltd., planned to construct facilities at Baie Comeau, Quebec, with a capacity of 160,000 tons by 1965. It is reported that the first stage of the project will be completed in 1957. There have also been reports that Reynolds Metals Co. was considering a plan to produce about 100,000 tons of ingot annually at Baie Comeau, and rumours concerning a development by Kaiser Aluminum and Chemical Corp. at Seven Islands have been published.¹⁶¹

(c) *Canada's Place in World Production and Trade*

The world's most important producer of aluminum is the United States with about 47% of total primary production in 1954. Next came Canada with about 18% of the total, the U.S.S.R. with an estimated 13% and the Federal Republic of Germany and France with about 4.5% each. In 1955

¹⁵⁷ Aluminum Company of Canada, Ltd., *Submission to the Royal Commission on Canada's Economic Prospects*, Montreal, February 22, 1956, hereafter cited as *Alcan Brief*, p. 15, showed 1955 production at 608,300 tons, suggesting exports of 88%. The D.B.S., *Preliminary Report on Mineral Production, 1955*, gave a production figure of 584,153 tons, on which basis exports would be 92% of production. Subsequently the Bureau appears to have revised its figure to 612,543 tons (*The Miscellaneous Metal Mining Industry, 1955*).

¹⁵⁸ *Alcan Brief*, pp. 1, 6–8, 12, 14, 15 and 16.

¹⁵⁹ *Ibid.*, pp. 14 and 16.

¹⁶⁰ See, for example, *The Financial Post*, Toronto, August 18 and September 29, 1956.

¹⁶¹ *The Financial Post*, Toronto, November 19, 1955; and February 4 and 11, March 31, April 21, May 19, June 16 and October 20, 1956. More recent reports have indicated that Reynolds would build near Massena, New York (*The Gazette*, Montreal, September 11, 1956, and *The Financial Post*, Toronto, December 29, 1956).

Canada's share of output outside the Soviet bloc was 21%, the same as in 1954. In 1935–38 the United States accounted for about 24% of total world production and Canada for about 8%. But, while Canada's share of the total has increased since prewar, it has fallen during the postwar period.¹⁶²

With consumption such a small fraction of domestic production, Canada is much the largest exporter of primary aluminum, supplying 75% of the world exports. Norway, Canada's largest competitor, exports only about one-eighth as much. Norwegian exports, however, are less concentrated than those of Canada.¹⁶³

Both the United Kingdom and the United States receive the bulk of their aluminum imports from Canada. In 1954, imports into the United Kingdom amounted to about 85% of consumption of primary aluminum or to 58% of consumption of primary plus secondary. Almost all United Kingdom postwar imports have come from Canada which supplied 98% of the total volume in 1954 and 92% in 1955.¹⁶⁴ Imports constitute a much less important proportion of total United States consumption — 13% of primary and 12% of primary plus secondary consumption in 1954.¹⁶⁵ According to United States trade data, Canada supplied 89% of total 1955 imports of "crude" and semi-fabricated aluminum, 72% of the imports of scrap and 9% of imported aluminum manufactures.

(d) *Market Outlook*

In Chapter 13 of Volume II which is devoted to aluminum, the Paley Report noted that aluminum and its alloys had the advantages of strength, lightness and resistance to corrosion. Compared with the older base metals, the industry in 1950 was still in its infancy, especially as supply could be increased greatly without serious increase in cost. Aluminum had become cheaper, even by weight, than copper, lead or zinc and the future cost outlook favoured aluminum. Substitution, however, would not be limited to the displacement of other non-ferrous metals but would also be at the expense of wood and steel.¹⁶⁶ The Report's projections are indicated in the table on the following page.

The Report foresaw ample supplies of bauxite in the Caribbean area and West Africa and, if these should be unavailable, techniques being developed could probably permit economic recourse to highly abundant aluminum clays and rocks, the use of which was not yet economic. Further, ample quantities of power could be made available in the United States to enable

¹⁶² *Minerais et Metaux, Statistiques 1954*, Paris, July 1955, p. 118; and *Alcan Brief*, p. 15.

¹⁶³ *Minerais et Metaux, op. cit.*, pp. 123 and 126; and *Alcan Brief*, pp. 4–5.

¹⁶⁴ *Minerais et Metaux, op. cit.*, p. 124; and *Accounts relating to Trade and Navigation of the United Kingdom*, London, H.M.S.O., December 1955.

¹⁶⁵ *Minerais et Metaux, op. cit.*, p. 125.

¹⁶⁶ A possibility which must not be ignored concerns the substitution for aluminum of plastics and such other metals as magnesium and titanium.

*Anticipated Increase in Aluminum Consumption**(thousands of short tons)*

	1950 Consumption	Projected consumption about 1975	Projected % increase
United States			
Scrap, excl. new scrap.....	63	900	1,329
New.....	920	3,600	291
Total U.S.....	983	4,500	358
Rest of free world			
(new only).....	465	2,400	416
Total free world.....	1,448	6,900	377
Total, excl. scrap.....	1,385	6,000	333

SOURCE: *Paley Report*, Vol. II, pp. 66, 118 and 132. These data are contained in Chap. 22 by Arnold C. Harberger, Johns Hopkins University, but were accepted by the Paley Commission elsewhere in the Report.

the production of the whole of the projected 1975 demand for aluminum and with but modest increase in the total real cost of production. In this connection, the Report noted that improved techniques were reducing power requirements and that dependence upon hydro power was decreasing with the decreasing cost of steam generated power and the higher cost of hydro-electric installations. Other necessary materials would also be available, although, with the depletion of the Greenland supply, the aluminum industry would probably soon be dependent on synthetic cryolite produced in part from fluorspar.

Despite this situation, however, the Report suggested that, security considerations permitting, it was likely that during the next 25 years the United States would obtain an increasing part of its aluminum supply from Canada and possibly from overseas sources where abundant low-cost power was potentially available near large bauxite deposits. On the basis of available evidence, Canadian operating costs (excluding depreciation) were 27% to 34% lower than those of the United States in 1949. About one-third of this was due to lower power costs and the balance to lower material, transportation and labour costs. The cost of potential power in Canada was also below that in the United States.

The Bureau of Mines study noted the substantial increase in United States aluminum consumption and productive capacity which occurred in the years following 1950. According to this source, apparent consumption of primary aluminum rose from 896,000 short tons in 1950 to 1,542,000 tons in 1953, while total consumption of primary and secondary aluminum rose from 1,199,000 tons to 1,931,000 tons. While these data are not comparable with those in the Paley Report, they show the magnitude of the increase. At the end of 1950, primary aluminum capacity of the United States was estimated at 860,000 short tons per year. Planned expansion, all of which

was represented by installed capacity by 1955, raised this figure to 1,523,000 tons. In 1953 United States primary and secondary production amounted to 1,621,000 tons while net imports were 345,000 tons. In the war, government financial aid was provided for the construction of plants. In the Korean emergency, government aid was furnished in the form of accelerated amortization for tax purposes, guarantees for private loans, market guarantees, and priorities for equipment and construction material.¹⁶⁷

Although recognizing the possibility of a faster rate of growth, the Paley Report forecast that between 1950 and 1975 the free world's consumption of primary aluminum would increase by 333% to six million short tons. If this rate of growth were extrapolated it would mean that in 1980 the free world would be consuming some eight million tons of aluminum per annum. In the five years from 1950 to 1955, however, free world production and consumption of aluminum approximately doubled, a rate of growth which, if continued over 25 years, would mean an increase of about 31 times, a rate of growth which obviously could not be maintained.¹⁶⁸ Together with the fact that there appears to be no letup in the growth in demand, however, it suggests that it would be appropriate to forecast higher absolute growth for the next 25 years than did the Paley Report for the period 1950 to 1975.

Obviously world consumption of aluminum may be expected to increase severalfold over the next 25 years. To what extent will Canadian exports keep pace with expanded consumption? On this question, Alcan has stated that Canada's position as producer of some 20% to 25% of the free world supply (21% in 1954 and 1955) will likely only be maintained if expansion in Canada continues at a rate greater than that presently scheduled. Canada is a good place to produce aluminum and will likely continue to be so, but has no natural monopoly. As long as Canada has economic power and smelter sites available for aluminum production, and as long as Canada has access to international markets that wish to obtain aluminum at prices as low as, or lower than, they can produce it themselves, it may be expected that primary aluminum production will expand in Canada. Available power could sustain aluminum production of some six million tons or roughly ten times present capacity. If, on the other hand, other nations are prepared to subsidize less economic domestic production, whether by tariffs or other means, or are prepared to divert to aluminum smelters electricity which they could use for more profitable purposes, the rate of growth in Canada will be retarded. The company noted that Canada has a natural market in supplying United States fabricators who operate in competition with the major producers. The reduction of the United States tariff on primary aluminum in the postwar period had undoubtedly benefited the Canadian company. In connection with international sales, the company stated

¹⁶⁷ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 17-35. It should also be noted that Canadian expansion was aided by U.K. loans and contracts.

¹⁶⁸ *Alcan Brief*, pp. 15, 35 and 40.

that it was not a member of any international cartel of aluminum producers and, to the best of its knowledge, the only impediments to the sale, production and pricing of primary aluminum were those imposed by governments in the form of tariffs, quotas and exchange controls.¹⁶⁹

Discussing the factors affecting location, it is noted in the section on aluminum in the Commission's mineral study that thermal power is much more competitive with water power than it once was. Added to this, in the United States advantage can be taken of the tariff, fast tax write-offs, and a ready supply of capital contingent upon assured long-term defence contracts. Thus capacity has shown a tendency to increase more rapidly in the major consuming countries in recent years, and the Canadian industry will have difficulty in increasing, if not maintaining, its present share of total United States aluminum sales. Overseas production prospects are less attractive. With the exception of a few countries like Norway, Austria and Yugoslavia, low-cost power is not available in Western Europe. Nor is the use of nuclear energy expected to have a significant effect upon the position. Readily developable hydro-electric resources exist in less developed parts of the world. In some areas such as the Gold Coast, French West Africa and Indonesia suitable reserves of bauxite are found close by. Labour costs might well be lower than in Canada, and the sale of aluminum on a soft currency basis might have obvious advantages. On the other hand, these countries would be faced with higher rates of interest and other carrying charges and costs of a less tangible character typical of investment in areas of uncertain political stability. Canada, meanwhile, has enough cheap power to ensure tremendous expansion in output. Sites ensuring minimum transportation costs are available, as is industrial know-how and the political climate necessary for raising large sums of money at comparatively low rates of interest. Thus Canada may well continue among the first two or three of the world's primary aluminum producing nations.¹⁷⁰

With respect to the possibility of increased production in underdeveloped countries, the forces at work include both the desire for industrialization and the importance of transportation costs which would tend to the production of aluminum closer to the sources of bauxite. Approximately four tons of dry bauxite are required to produce two tons of alumina necessary for the production of one ton of aluminum.¹⁷¹ Already Aluminium Limited has developed and is expanding facilities for the production of alumina in Jamaica. It has also been announced that alumina is to be produced in French West Africa and in British Guiana.¹⁷² Although it is not yet

¹⁶⁹ *Alcan Brief*, pp. 5, 6, 38-39, 45 and 46. In 1956 the United States agreed to a further tariff reduction of 0.25c. per pound (from 1.5c.) spread over three years.

¹⁷⁰ John Davis, *Mining and Mineral Processing in Canada*. The forecast in the mineral study was substantially changed after the present volume went to press.

¹⁷¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 23.

¹⁷² *The Gazette*, Montreal, November 16 and December 13, 1956; and *The Financial Post*, Toronto, November 24, 1956.

known how quickly the Volta River project in the Gold Coast may become a reality, Aluminium Limited and British Aluminium Limited are interested in this project which could involve the production of from 210,000 to 230,000 tons of aluminum annually.¹⁷³ In addition, press reports have indicated that Aluminium Limited and the three United States producers of aluminum were studying the feasibility of building an aluminum reduction plant in Venezuela; that Aluminium Limited had announced plans to construct a 10,000-ton smelter in India, thus doubling Indian capacity; and that Aluminium Limited was interested in a project in French West Africa where hydro-electric power might support production of 200,000 to 250,000 tons of aluminum annually.¹⁷⁴

Interest also attaches to the bauxite discovery in northern Queensland and it has been suggested that smelting might take place in New Guinea.

The section on aluminum in the Commission's mineral study concludes that it would appear unlikely that Canadian production could do better than maintain its present 20% relationship to world consumption, and it is assumed that Canadian participation will fall to 17% in 1965 and to 15% in 1980. The Aluminum Company of Canada has stated that it seemed likely that, with growing domestic demand and stronger competition abroad, export markets for Canadian semi-fabricated products might decline in relation to total sales, although growing in absolute amount.¹⁷⁵ On the other hand, exports of scrap may increase relative to total exports, so that perhaps the best assumption is that the value of exports in other than primary form will increase parallel with the increase in exports of primary aluminum. Assuming an increase of 300% between 1955 and 1980, Canada's exports of aluminum and products would rise to \$850 million in the latter year, valued at 1955 prices. As regards prices, in 1955 the average value of Canada's exports of primary aluminum was 19.5c. a pound and the Commission's mineral study uses a rounded price of 20.0c. a pound. Prices, however, increased considerably more than this during 1956. In the first half of the year, the average export value was 21.5c. a pound and in June 1956 it was 22.3c. In August 1956, it was announced that Alcan was increasing the price in domestic and overseas markets by a further 1c. a pound.¹⁷⁶

At a price of 23.3c. a pound, an increase of somewhat less than 300% would produce a 1980 export value of \$1 billion. In the light of the probable total exports to and imports from the United Kingdom and other overseas countries as considered in Chapter 4 of Part A, together with the possibility of the production of aluminum in soft currency countries, it is assumed

¹⁷³ *The Financial Post*, Toronto, August 4 and 11, 1956; and *The Ottawa Journal*, August 14, 1956.

¹⁷⁴ *The Financial Post*, Toronto, November 19, 1955, January 7 and 21 and March 17, 1956; and *The Globe and Mail*, Toronto, January 16, 1956.

¹⁷⁵ *Alcan Brief*, p. 31.

¹⁷⁶ *The Financial Post*, Toronto, August 18, 1956.

that exports to the United States will increase more rapidly than those to overseas markets. Accordingly, it is suggested that exports to the United States will grow from \$84 million in 1955 to \$525 million in 1980, those to the United Kingdom from \$99 million to \$350 million, and those to other countries from \$29 million to \$125 million.

The increase in the volume of exports being projected would raise Canada's exports of primary, semi-fabricated and scrap (including new scrap) aluminum from 537,000 tons in 1955 to 2,110,000 tons in 1980. Adding 550,000 tons for Canadian consumption in 1980 as suggested in the Alcan Brief, required Canadian production in 1980 would approach 2,660,000 tons, more than four times the production in 1955. Earlier in this section it was noted that Alcan's present plans involve an increase in capacity to 1,252,000 tons, including the full development at Kitimat and the new capacity planned for the Saguenay region. Adding that of the Canadian British Aluminium Company, planned capacity aggregates 1,412,000 tons. Beyond this base, a further 88% increase in capacity would be required to support projected exports and domestic consumption.

17. Copper and Products

(a) General Export Position

While the value of Canada's copper exports has more than tripled since the late 1930's, the volume has remained below the prewar peak. Between 1929 and 1938, exports of unmanufactured copper rose from 123,000 short tons to 280,000 tons. While postwar expansion has carried the figure to 232,000 tons, this is still substantially below the 1938 level. By value, copper exports, including manufactures, have risen from \$37 million in 1929 to \$53 million in 1938 (\$56 million in 1937) and to \$175 million in 1955. For the first time in 25 years, 1955 copper exports exceeded the value of gold production available for export.¹⁷⁷

The \$175 million of exports in 1955 were divided by value as follows: copper in ore, matte and regulus, 16%; scrap, slag, skimmings and sludge, 7%; ingots, bars, cakes, slabs and billets, 63%; rods, strips, sheets and plates, 8%; copper tubing, 1%; insulated wire and cable, 4%; and bare wire, 1%. In addition, there were small exports of copper wire screen and miscellaneous copper manufactures.

The area distribution of Canada's exports of copper over the past 30 years shows considerable change. Considering the value of exports of copper and manufactures, the United States took between 85% and 88% in the years 1926 to 1929. In 1930, the figure rose to 95.5%, but from 1933 to 1943 it fluctuated between 6% and 24%. Since 1949 the United States has taken between 36% and 56% of Canada's copper exports. In 1955 the

¹⁷⁷ In the first ten months of 1956, higher average copper prices and an increase in the volume of exports carried exports of copper and products to \$168 million, as compared with \$138 million in the same period of 1955.

figure was 47%. According to the brief presented to the Commission by the International Nickel Company of Canada, Limited, the United States imposition of an excise tax of 4c. a pound on the importation of copper in 1932 virtually destroyed the market outlets for copper in that country. Since April 30, 1947, the excise tax which has been cut to 2c. a pound has been suspended, reintroduced, and then suspended again. Unless further action is taken, this tax will become effective again on July 1, 1958.¹⁷⁸

Exports of copper to the United Kingdom have to some extent varied inversely with those to the United States, rising from under 2% of the total in 1930 to 64% in 1934, 1936 and 1937, and reaching a peak of almost 75% in 1940. In 1952, the United Kingdom share was 21%, and in 1955 it stood at 30%, almost all in the form of ingots, bars, cakes, slabs and billets. Since 1953, copper has been under the United Kingdom open individual licence system and is traded under the organized commodity market arrangements. It may be re-exported from the United Kingdom on a sterling basis regardless of its origin.

In 1955 other countries took 23% of total exports, with relatively heavy purchases by Norway, the Federal Republic of Germany, France and Switzerland, and smaller purchases (but still over \$1 million) by Australia, India, New Zealand, Cuba and Venezuela. Exports to Norway accounted for 4.4% of the 1955 total. As noted in Section 19, the refinery of Falconbridge Nickel Mines, Limited, is located in Norway and exports were entirely in the form of ore, matte and regulus, accounting for 27% of total exports of this item.

It may be noted that, taking copper, brass and bronze together, 1955 exports totalled \$183 million, imports \$24 million, and net exports \$158 million. In trade with the United States, total exports were \$86 million, imports \$22 million, and net exports \$64 million.

(b) *Canadian Production*

Primary copper production in Canada amounted in 1955 to almost 326,000 short tons. In 1956 it rose to a record level of 353,000 tons. In 1955 Ontario produced 45% of the total copper output, Quebec 31%, Saskatchewan 10%, British Columbia 7%, and Manitoba 6%. Almost all of the copper production in Ontario and part of that in Manitoba was from nickel-copper ores. Most of the remainder (51% of Canadian production) came from copper-gold-silver ores.¹⁷⁹ Comparing all exports for which quantity data are presented in the trade statistics (*i.e.*, all exports except copper wire and cable, copper wire screen and miscellaneous copper manu-

¹⁷⁸ The International Nickel Company of Canada, Limited, *The Nickel Industry in Canada*, Toronto, January 25, 1956, hereafter cited as *Inco Brief*, p. 39.

¹⁷⁹ D.B.S., *The Canada Yearbook, 1939 and 1947; The Nickel-Copper Mining, Smelting and Refining Industry, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*. Primary copper is blister copper produced, plus recoverable copper in matte and concentrates exported.

factures) with production of primary copper, exports were 71% of production in 1955.

Mr. H. L. Roscoe, Vice-President of Noranda Mines, Limited, suggested in his submission to the Commission that the existing price of copper would bring some further increase in Canadian production in the next few years. For the long term, however, a sustained search would be necessary in order to maintain present production. In the Hearings of the Commission, Mr. Roscoe stated that he was reasonably optimistic about the results of the search for copper, but that a lot of looking was required.¹⁸⁰ More optimism for the future was expressed in other Briefs presented to the Commission.¹⁸¹

(c) *Canada's Place in World Production and Trade*

The United States is much the world's largest producer of copper in mineral form with 27% of the estimated production in 1954 (31% in 1953). In 1954 the second largest producer was Northern Rhodesia with 14% of the total, followed by the U.S.S.R. with an estimated 13%, Chile with less than 13%, Canada with under 10%, the Belgian Congo with 8%, and a number of other much smaller producers. Between 1935-38 and 1954, production increased by 54%, but the most rapid increases were in Africa and the U.S.S.R. In 1935-38, the three largest producers were the United States with 43%, Chile with 17% and Canada with 12%.¹⁸²

On the consumption side, the United States in 1954 accounted for 34% of the estimated world total (43% in 1953). Following the United States in 1954 were the United Kingdom with 14%, the U.S.S.R. with an estimated 13%, and the Federal Republic of Germany with 10%. Other important consumers were France, Japan, Italy and Canada (with about 3%).¹⁸³

In 1955 United States mine production of recoverable copper amounted to 993,000 short tons, somewhat above the five previous years but below the 1,091,000 tons of 1943 and 998,000 tons in 1929. As domestic production has not grown with consumption, imports have become more important. Imports of refined, unrefined and scrap copper in 1955 were 601,000 tons or 61% of the United States mine production of copper, and 39% of the consumption of refined copper.¹⁸⁴

¹⁸⁰ *Submission to Royal Commission on Canada's Economic Prospects* by H. L. Roscoe, Vice-President, Noranda Mines, Limited, January 24, 1956; *Royal Commission on Canada's Economic Prospects, Hearings*, p. 4928.

¹⁸¹ See *Submission of the Mining Association of British Columbia to the Royal Commission on Canada's Economic Prospects*, December 31, 1955, p. 11; *Submission of Ontario to the Royal Commission on Canada's Economic Prospects*, January 26, 1956, p. 154; Northwestern Ontario Associated Chambers of Commerce, Northwestern Ontario Municipal Association and Northwestern Ontario Development Association, *Northwestern Ontario Brief presented to the Royal Commission on Canada's Economic Prospects*; Canadian Metal Mining Association, *Submission to Royal Commission on Canada's Economic Prospects*, Toronto, January 1956, p. 4; *Submission by the Government of the Province of Newfoundland to the Royal Commission on Canada's Economic Prospects*, October 1955, pp. 48-50.

¹⁸² *Minerais et Metaux, op. cit.*, p. 13.

¹⁸³ *Ibid.*, p. 16.

¹⁸⁴ U.S. Department of Commerce, *Business Statistics, 1955. Supplement to the Survey of Current Business; and Survey of Current Business*, March 1956.

Canada is the second most important foreign supplier of copper to the United States. According to United States trade data, in 1955 Canada supplied 18% of the volume and value imported into the United States. Most important was Chile, with 37% of the volume and 36% of the value. Other significant sources were Rhodesia-Nyasaland with 12% of the total value, Mexico with 8.5%, and the United Kingdom and Peru with about 5% each.

Since 1950 Chile's share of the United States market has decreased while that of other major suppliers has risen. By value, Chile's share fell from 47.1% to 35.7%. The share of Canada rose from 15.7% to 18.4%, that of Rhodesia-Nyasaland from 7.6% to 11.6%, that of Mexico from 7.4% to 8.5%, that of the United Kingdom from 0.7% to 5.3%, and that of Peru from 2.8% to 4.8%. The volume of total imports (except finished manufactures) showed a slight decline between 1950 and 1955.

The data published by *Minerais et Metaux* show that the United Kingdom relies heavily on imports. In 1954, production of refined copper was 50% of consumption but total imports, including the raw materials for United Kingdom refineries, were 91% of consumption. Imports less re-exports were 83% of consumption plus domestic exports.¹⁸⁵ United Kingdom import data suggest that Canada and Chile, especially Chile, have been improving their positions over recent years relatively to Rhodesia and Nyasaland, at least with respect to the copper which is identified as to source. Between 1953 and 1955, the share of total imports provided by Rhodesia and Nyasaland declined from 65% to 53%, while the share supplied by Canada rose from 14% to 16% and the share supplied by Chile went up from zero to 14%.

(d) *Market Outlook*

"The widespread use of copper stems from its excellent conductivity of electricity and heat, its resistance to corrosion, and its properties of ductility, malleability, and strength. Nearly half is used by the electrical industry in virtually pure metallic form and most of the remainder in the manufacture of brass, bronze, and other alloys, for ultimate use in buildings, automobiles, ships, and other applications. During times of mobilization and war, copper's most important use is in ammunition and in communications, although there are many other vital uses. Steel has replaced copper for some ammunition purposes, and aluminum is acceptable for some electrical uses. On the whole, however, copper is expected to be consumed in increasing quantities in future, following much the same growth pattern as in the past."¹⁸⁶

¹⁸⁵ *Minerais et Metaux*, *op. cit.*, p. 22.

¹⁸⁶ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 219. The matter of substitutes for copper is discussed on p. 236.

The Paley Report's forecast for copper is indicated by the following table.

Copper Position, 1950, and Projected, 1975.

(thousands of short tons)

	1950	1975	% increase
U.S. consumption (incl. scrap)	1,730	2,500	45
U.S. production — mine	907	800	—12
— secondary	475	700	47
U.S. net imports	448 (a)	1,000 (b)	123
Other free world consumption (excl. scrap)	1,343	2,050	53
Other free world mine production	1,608 (a)	3,050 (b)	90

(a) Variation from calculated result reflects changes in stocks.

(b) Required.

SOURCE: *Paley Report*, Vol. II, p. 36. See also Vol. II, pp. 118–120 and 132–133.

Reserves in other free countries were regarded as adequate to support the required production. At a minimum estimated at 190 million tons, they were over 60 times the “required” 1975 level of production. Moreover, the great bulk of the reserves occurred in a few very large deposits and thus could support a large expansion. Adequate reserves, however, did not mean that expansion could be taken for granted, even allowing for the stimulus given by United States demand to the expansion of United States controlled output. Obstacles included policies on taxes, exchange rates, foreign investment, capital transfers, labour and expropriation. Further, foreign producers were faced with shortages of fuel, power, transportation and labour, and it would seem that \$2 billion to \$3 billion would be needed to bring about the necessary expansion. Continued efforts would have to be made to overcome the obstacles, but if sufficient expansion was achieved, the cost of copper in 1950 dollars was expected to stay at about the 1950 price (24.20c. per pound). Nevertheless, the obstacles noted were felt to mean that a steady tendency for demand to run ahead of supply was “a strong possibility” for the foreseeable future.¹⁸⁷

A discussion of reserves suggested both that Canadian reserves were small and that they were relatively low-grade. With respect to the latter aspect, the Report made the comment that few if any of the large United States deposits could be worked profitably if situated in Northern Rhodesia or Chile. Political stability, nearness to markets, adequate power, transportation, skilled labour and competent management made the difference.¹⁸⁸ The same factors are important with respect to Canadian production. Also.

¹⁸⁷ *Paley Report*, Vol. II, pp. 36–38 and 33.

¹⁸⁸ *Ibid.*, Vol. II, pp. 36–37 and 144–145.

Canadian ores are relatively complex, although the necessity of producing and marketing co-products brings disadvantages as well as advantages.

A more recent consideration of the outlook for copper was contained in an article by William P. Shea, published in the August 1955, issue of *Engineering and Mining Journal*. Starting from 1954, a somewhat depressed year in the United States but not in overseas countries, Mr. Shea would appear to have expected about the same rate of growth in United States copper consumption as did the Paley Report, but a slower rate of growth in consumption in countries other than the United States. United States production of new copper in 1975 would be somewhat above that suggested in the Paley Report, and required United States imports would rise somewhat less. The great difference, however, resulted from the relatively modest increase in copper production which Mr. Shea saw taking place outside the United States. Mine production of copper was expected to increase by only 19% as against the 90% increase which the Paley Report regarded as necessary.

Moving from the tight situation in 1954 when there was little margin for stockpiling, Mr. Shea expected that, between 1955 and 1960, it was likely that the supply of new copper would tend to exceed both industrial and governmental requirements. For the period 1960 to 1975, however, present sources of supply seemed inadequate for rising industrial requirements throughout the world. New sources would have to be developed. Thus his data showed a deficit of industrial use over production of 420,000 tons in 1975. The restoration of equilibrium in the period 1956 to 1960 led to the expectation that copper prices would revert to a level of about 30c. a pound. At this level copper producers generally enjoyed a satisfactory profit margin. Beyond 1960, the long-term price of copper would depend on how adequately sources of supply were expanded to meet rising demand. Based on prospects for both demand and supply, a reasonable expectation seemed to be a long-term price level of 30c.

The section on copper in the study by the United States Bureau of Mines noted that, while copper occurred widely in nature, most of the world's mine production was in a few places and from very large production units. About 90% of the unmined world copper resources was in five regions — South-Central Africa, Chile, the western United States, eastern Ontario and southern Quebec, and Kazakhstan in the U.S.S.R.¹⁸⁹

In response to the strong postwar demand, the major producers had undertaken new production and expansion projects. Some, but not all, of the United States projects have received government assistance, through loans, purchase contracts and tax amortization benefits. Also Export-Import Bank credits were made available to assist in financing the United States dollar cost of bringing one of the Peruvian properties into production,

¹⁸⁹ U.S. Department of the Interior, Bureau of Mines. *op. cit.*, pp. 220 and 223-4. Subsequent data suggest the addition of large Peruvian deposits.

and a company operating in Northern Rhodesia received a United States Government loan. Various Canadian developments were listed.¹⁹⁰

Only under such abnormal conditions as a major depression were United States mines seen likely to fill total domestic demand, and then only if prices remained high in relation to costs. Growing dependence upon imports, however, resulted more from the increase in United States consumption than from the exhaustion of domestic reserves, and was met in part by increased imports from Africa and Canada, but principally from Chile. Of supplies from Chile, virtually all were received from properties controlled by two United States companies. Western Hemisphere production was held to be adequate to take care of Western Hemisphere requirements, but United States dependence on imports had led to the establishment of a large national strategic stockpile objective. At the end of 1954 the objective was still incomplete.¹⁹¹

In attempting to assess the future value of Canada's copper exports, a problem of considerable magnitude concerns the likely development of copper prices. In about 14 months, the New York price of copper rose from about 30c. a pound to 46c. and over. Thus in February 1956, the major United States producers raised their prices to 46c. United States custom smelters, however, were soon quoting prices as high as 55c. and comparable prices were achieved on the London Metal Exchange. Subsequently, the premium over the 46c. price of the major United States producers disappeared and was replaced by a discount. After a move by International Nickel early in July, the price of major United States producers was cut to 40c. In January 1957, this price was 36c. and that of the custom smelters 35c.¹⁹²

In the face of considerable uncertainty, the best assumption is perhaps that Canada's copper exports in 1980 will take place at the same average value as was registered in 1955. In that year Canada's exports of copper in ingots, bars, cakes, slabs and billets had an average f.o.b. value of 35.8c. a pound. This corresponded to a New York price which during the year averaged about 37.5c.

The next question concerns access to the United States market. Reference has been made to the possibility of the reimposition of the United States excise tax of 2c. a pound on copper imports. According to the International Nickel Company, "this constant overhanging risk of the United States duty has clouded the outlook for Canadian copper and prevented sales development in this adjacent and logical large market."¹⁹³ Nevertheless, all indications are that, if the United States remains moderately pros-

¹⁹⁰ *Ibid.*, pp. 229-231.

¹⁹¹ *Ibid.*, p. 239.

¹⁹² *The Gazette*, Montreal, May 28, June 11, July 16, August 20 and 23, and September 17, 1956, and January 21, 1957; and *The Financial Post*, Toronto, July 7, 1956.

¹⁹³ *Inco Brief*, p. 39.

perous, it will have to import very large quantities of copper. The Paley Report projected an increase of 123% in United States copper imports between 1950 and 1975 and an examination of the situation suggests the reasonableness of the expectation that the increase between 1955 and 1980 will be at about this rate. The significance of the costs of bringing new properties into production, and the various problems which face producers outside North America, suggest that, despite the probability of lower total ore reserves, Canada can probably hold its own in competition with other producers in the United States market.

In overseas markets, it seems less likely that Canada will share fully in the growth in consumption. Thus, while the Paley Report predicted that other free world consumption would increase by 53% between 1950 and 1975, it is here assumed that Canada's overseas exports will rise between 1955 and 1980 by about 25%. The forecasted growth in overseas consumption may, however, considerably understate the possibilities, if adequate supplies are available. While the United States consumes annually about 17 pounds of copper per head, the balance of the world appears to use less than two pounds per head.

On the basis of these considerations, the following projection is offered for Canada's copper exports.

Projection of Canada's Copper Exports

	1950	1955	1980
Thousands of tons			
U.S.....	90	106	235
Overseas.....	99	126	160
Total.....	189	232	395
Millions of dollars			
U.S.....	42	82	182
Overseas.....	46	93	118
Total.....	88	175	300

Can Canada supply exports of copper aggregating 395,000 tons in 1980? The vice-president of Noranda Mines, Limited, has suggested that annual Canadian consumption might rise from 138,000 tons to 215,000 tons over the 25-year period.¹⁹⁴ Exports plus consumption aggregating 610,000 tons in 1980 compare with 370,000 tons in 1955. The latter figure exceeds Canadian production of 326,000 tons. There is, however, some double counting resulting from exports of manufactures and scrap. Also, part of Canadian consumption is supported by imports. The appropriate question, therefore, would seem to be whether Canadian production can keep pace with an increase in consumption plus exports from 370,000 tons to 610,000 tons. This would be an increase of 65%.

¹⁹⁴ H. L. Roscoe, *op. cit.*

The press has contained article after article about the discovery and development of new supplies of copper in Canada. The bringing into production of new copper properties requires both time and money. Nevertheless, given the demand which is expected and a New York price of 37.5c. or more, it would seem that an increase in Canadian production of some 65% is not an unreasonable expectation. Canada would appear to have the copper resources available and, in the circumstances anticipated, production should be able to support exports of close to 400,000 tons in 1980.

18. Lead and Products

As in the case of copper, Canada's exports of lead have been lower in recent years than they were in 1937 (or 1938 in the case of copper) when lead in ore and pig and refined lead amounting to 185,000 tons were exported. In 1954 these exports aggregated 176,000 tons, but in 1955 they were down to 151,000 tons. In 1937 these exports had a value of \$18 million. The peak was established in 1952 when 154,000 tons were valued at \$49 million. In 1954, however, the value was \$40 million and in 1955 it was \$37 million.¹⁹⁵

Almost all of Canada's lead exports are in ore or in pig and refined form. Since the prewar period the relative importance of these two categories has altered significantly. With the increase in lead mining in eastern Canada, the export of lead in ore has risen substantially, from 8,000 tons in 1937 to 24,000 tons in 1952 and to 58,000 tons in 1955. Meanwhile, there has been a decline in the export of pig and refined lead — from 177,000 tons in 1937 to 130,000 tons in 1952 and to 93,000 tons in 1955. Minor quantities of lead are exported in other forms. In 1952 exports of lead scrap were valued at \$1.2 million but in 1955 the value was down to \$81,000. Lead manufactures in 1955 aggregated only \$24,000. Exports of the two major categories were valued at \$15 million and \$22 million, respectively, in 1955, so that lead in ore had a slightly higher average value than did pig and refined lead.

The United Kingdom was Canada's most important market for lead in the prewar period, taking well over half of total export in the years 1937 to 1939. Next in importance in these years was Japan. The United Kingdom has remained an important market in the postwar period but, in each year since 1947, has been less important than United States. Other consistently important markets in recent years have been Belgium-Luxembourg and the Federal Republic of Germany. Of total exports of lead and products in 1955, 45% of the total value went to the United States, 35% to the United Kingdom, 12% to Belgium-Luxembourg, 6% to the Federal Republic of Germany, and 1% to Japan. The value was above that in 1952 in each case

¹⁹⁵ Between the first eleven months of 1955 and the same period in 1956, exports of lead and products declined from \$34.7 million to \$33.1 million, despite higher prices.

except that of United States where it was less than half of the \$36 million of the earlier year.

As a producer of lead ore, Canada with 10% of the world's total in 1954 followed the United States and Australia with about 15% each, and Mexico and the U.S.S.R. with about 11% each.¹⁹⁶ While Canada has a relatively large share of the world's ore reserves, recently discovered potential lead-zinc producers both in eastern and northwestern Canada are relatively low in lead as compared with zinc.

The Paley Report was relatively optimistic about the future of lead. Between 1950 and 1975, total United States demand for lead was expected to increase by 61%, and demand for new lead (as opposed to scrap) by 53%. In the rest of the free world the increase in demand was expected to be 78%. As United States mine production was expected to decline, required United States imports were expected to grow over the period by at least 59%, taking account of an increase in secondary production. To meet demands outside the United States and United States import requirements, mine production in the rest of the free world would have to double between 1950 and 1975. Despite a relatively good reserve outlook, however, the outlook for a doubled production was stated not to be good. Demand was unlikely to be satisfied over much of the 25-year period at prices near the existing level, so that the price of lead might be expected to show a marked tendency to rise relative to general prices. Some major adjustment was expected to have to come on the demand side.¹⁹⁷

The recent study of the United States Bureau of Mines took a somewhat different position. It noted that world production of primary and secondary lead in the period 1948 to 1954 was well in excess of world requirements so that large stocks were accumulated. In 1950 and 1951 consumer demand and the stockpiling programme not only stimulated further production but absorbed much of the excess output. In 1952 stockpiling and world consumption were both cut back so that prices began to fall. Much of the excess production was shipped to the United States where prices fell and mines were closed. In the second half of 1954, resumption of United States stockpiling and increased world consumption tended to alleviate the market situation somewhat and there were indications that United States production was reviving.¹⁹⁸

In the section on the outlook for lead, the Bureau stated that world reserves of developed and inferred ore were adequate to meet foreseeable uses for the next 30 years and that the potential reserves of undeveloped areas were believed even greater. Future United States supply, however,

¹⁹⁶ Data from the Annual Report of the American Bureau of Metal Statistics appearing in D.B.S., *The Silver-Lead-Zinc Mining Industry, 1954*.

¹⁹⁷ *Paley Report*, Vol. II, pp. 118 and 132, and Chap. 6, pp. 39-45.

¹⁹⁸ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 418.

would be derived in even larger part from imports and secondary sources, as consumption was expected to increase while domestic mine production remained relatively constant. United States consumption of lead was expected to be about 1.2 million tons in 1955 and to rise to about 1.45 million tons by 1975. Elsewhere in the world, consumption should increase considerably owing to improved standards of living as well as increased population in many areas. As regards the problems facing lead, it was stated that the distress caused by the current oversupply could best be met by action to reduce cost of production and by greater development of markets. In the long run, however, the problem in supply would be one of shortage. The easily discovered deposits had been found. Those yet to be found required intensive search.¹⁹⁹

Looking forward to 1980, it is here suggested that Canada's exports of lead and products will amount to \$50 million. This would represent an increase of 35% in value over exports in 1955, but would be merely a return to the 1952 value of exports. It is recognized that this projection may understate the future of Canada's lead exports. The market related to nuclear processes may increase and other overseas consumption may grow relative to that in the United States. On the other hand, the use of lead in pigments has declined and there hangs over the industry the possibility of a substantial decline in consumption resulting from the disappearance of the use of lead in the production of gasoline accompanying the switch to gas turbine engines. In other uses, recovery as scrap is high relative to most metals. Accordingly, it seems desirable to employ a relatively modest projection.

19. Nickel

(a) General Export Position

Ranking about equal to aluminum in the postwar period, nickel was Canada's most important mineral export in 1955, other than manufactures of iron and steel. At \$215 million, domestic exports of nickel accounted for 4.8% of total domestic exports including gold.

All the nickel exports identified in the Canadian trade statistics are in primary form, although United States import data show minor quantities of nickel in bars, rods, plates, sheets, strips, etc., as coming from Canada. Of the \$215 million of nickel exports in 1955, \$135 million consisted of fine nickel (nickel in pigs, ingots, etc., in the United States import statistics). The nickel content of exports of matte or speiss amounted to \$79 million, and nickel content of oxide was valued at \$1 million.

Domestic exports of nickel rose from 55,000 tons in 1929 to 111,000 tons in 1937 and to 174,000 tons in 1955. The value of these exports rose

¹⁹⁹ *Ibid.*, p. 443. The projection of 1.45 million tons of U.S. consumption by 1975 compared with a projection in the *Paley Report* of 1.95 million tons in the same year, of which 750,000 tons would be scrap and 1.2 million tons would be new lead.

from \$26 million in 1929 to \$59 million in 1937 and, as noted, to \$215 million in 1955. Fine nickel has constituted the largest quantity, as well as the largest value, in each of the years. Nickel oxide, consistently the smallest of the three items, has declined in relative importance, falling from 10% of the total volume and 14% of the total value in 1929 to less than 1% of both volume and value in 1955. Another marked change has been the rise in the unit value of nickel in matte or speiss relative to fine nickel, particularly since 1937.

Although Canada dominates the free world mine production of nickel, its exports are very highly concentrated on three countries. In 1954 and again in 1955, 68% of the value of total domestic exports went to the United States, 19% to the United Kingdom and 12% to Norway. This heavy concentration has existed in every year since 1948, but was somewhat less marked before the war. In 1937 the United States took 38% of total domestic exports, the United Kingdom 42% and Norway 4%.

In 1955 the United States took 92% of Canada's fine nickel exports by volume but only 27% of the matte or speiss. The total volume of shipments to the United States increased by 145% from 1937 to 1955. Most of the recent nickel exports to the United Kingdom have been in the form of matte or speiss for which the United Kingdom is the largest market (as it also was in the late 1920's and in the late 1930's). Part of the production of the International Nickel Company of Canada, Limited, is refined in Wales by its subsidiary, the Mond Nickel Company, Limited. As a result of the decline in fine nickel shipments, however, the total volume of Canada's nickel exports to the United Kingdom in 1952-55 was only 70% of that in 1937-38. Exports to Norway were negligible in the late 1920's and have more than doubled in volume since the late 1930's. These exports consist entirely of nickel in matte or speiss, Falconbridge Nickel Mines, Limited, having a refinery in Norway. The re-export of Canadian nickel after refining in the United Kingdom and Norway helps to explain the heavy concentration of Canada's exports.

(b) Canadian Production

The mining of nickel in Canada is associated with the recovery of a number of other metals. The same ores produce nickel, copper, the platinum metals, silver, cobalt, gold, selenium and tellurium. In addition, sulphur dioxide is also recovered.²⁰⁰ Recently, the recovery of iron ore has been put on a commercial basis.

After a sharp decline following the first world war, Canadian nickel production grew to 55,000 tons in 1929. It fell during the depression to 15,000 tons in 1932 but by 1937 it had exceeded 112,000 tons. During World War II, output rose to 144,000 tons in 1943 and then declined. Since

²⁰⁰ D.B.S., *The Nickel-Copper Mining, Smelting and Refining Industry, 1955*.

1950 there has been a considerable further increase, from 124,000 tons in that year to 161,000 tons in 1954, 175,000 tons in 1955 and 178,000 tons in 1956.²⁰¹

Consumption of refined nickel in Canada was less than 3,000 tons in each postwar year up to 1954 and in 1955 was 5,000 tons. Thus the bulk of Canada's nickel production has been exported; in 1955 exports were 99% of production.²⁰²

Canadian nickel reserves would appear to be adequate for the foreseeable future. The International Nickel Company's proven ore reserves in 1954 were stated to have a nickel-copper content almost 30 times 1954 production. Despite the high level of production, the total of these reserves had risen gradually since the war and in 1954 was at a new high.²⁰³ Falconbridge also had large and increasing developed and indicated ore reserves relative to production.²⁰⁴ At the recent rate of output, Sherritt Gordon reserves at Lynn Lake would last 20 years, and prospects of doubling this figure were regarded as reasonably good.²⁰⁵ Manitoba also has large additional lower grade nickel reserves at Mystery Lake and at Moak Lake (where International Nickel has announced that it will develop mines). Further, at least one deposit of copper-nickel ore has been outlined in southeastern Manitoba.²⁰⁶ Development work is not limited to Ontario and Manitoba but is also being carried out in Quebec, British Columbia, the Northwest Territories and the Yukon, and a new smelter is expected to be producing at Chicoutimi in 1958.²⁰⁷

(c) *Canada's Place in World Production and Trade*

Although losing ground recently to other producers, Canada is still much the largest of the world's producers of nickel. In 1955, 64% of the estimated total world production or about 78% of the production outside the U.S.S.R. came from Canada. The U.S.S.R. was probably the second largest producer with an estimated 17% of the world total, followed by New Caledonia (10%), Cuba (6%), the United States (2%) and the Union of South Africa (1%).²⁰⁸

²⁰¹ *Inco Brief*, p. 47; and D.B.S., *The Nickel-Copper Mining, Smelting and Refinery Industry, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²⁰² D.B.S., *The Nickel-Copper Mining, Smelting and Refining Industry, 1955*; and *Trade of Canada*.

²⁰³ *Inco Brief*, pp. 3 and 7. See also Royal Commission on Canada's Economic Prospects, *Hearings*, p. 4969 (statement by Inco president).

²⁰⁴ Ontario Mining Association, *Brief to Royal Commission on Canada's Economic Prospects*, January 1956; and *Inco Brief*.

²⁰⁵ *Prospects for Development in Manitoba*, a Submission presented to the Royal Commission on Canada's Economic Prospects by the Government of the Province of Manitoba, Winnipeg, November 14, 1955, p. 47.

²⁰⁶ *Ibid.*, pp. 47-49. See also *The Gazette*, Montreal, July 27, 1956; and *The Financial Post*, Toronto, July 28, 1956.

²⁰⁷ D.B.S., *The Nickel-Copper Mining, Smelting and Refining Industry, 1955*; and *The Financial Post*, Toronto, September 15, 1956.

²⁰⁸ D.B.S., *The Nickel-Copper Mining, Smelting and Refining Industry, 1955* (data from the Annual Report of the American Bureau of Metal Statistics).

In 1954 the United States appears to have consumed about half of the free world's metallurgical production, the United Kingdom 11% and France 4%.²⁰⁹ These data, however, would not seem to reflect deliveries for the U.S. stockpile. International Nickel has estimated that in 1954 the United States received 68.5% of total free world deliveries and the United Kingdom, 13%.²¹⁰

Until recently the United States produced only about 1% of its nickel requirements, although it was expected to be producing nearly 5% by mid-1955.²¹¹ United States trade data show that in 1955 Canada supplied 79% of United States nickel imports by value and 81% by volume. Most important in the imports from Canada were nickel in pigs, ingots, etc. (\$127 million). At \$14 million, nickel oxide was more important than indicated in the Canadian trade data and, at \$3 million, nickel ore and matte considerably less important. The balance of nickel imports into the United States in 1955 came largely from Cuba (9% by value, in the form of oxide), Norway (10%, in pigs and ingots), and France (1%, almost all in pigs and ingots). The concentration of imports in the form of pigs and ingots occurs despite the fact that these bear a duty of 1.25c. a pound, while ore, matte and oxide enter the country duty free. The tariff on fabricated nickel alloy products varies from 6.25% to 17.5%.²¹²

The United Kingdom imports nickel ore, concentrates and matte for local refining. According to U.K. trade statistics, in the years 1952 to 1955, these imports came almost entirely from Canada. Of less importance in U.K. imports is refined nickel. The U.K. trade data do not show the source of these imports, but, according to figures published by the United Nations, 46% of such imports in 1955 came from Canada, 16% each from Norway and from the United States and 14% from Japan.²¹³

(d) *Market Outlook*

The Paley Report projected a doubling of the demand for nickel between 1950 and 1975, both in the United States and in the rest of the free world. Because of the possibilities of shifts in response to technological change and comparative supply conditions, however, the projections offered for the additive or alloying metals were regarded as subject to an unusually wide margin of error. Nevertheless, United States production of alloy steels would probably increase faster than that of carbon steel, so that the use of nickel and other additive metals was expected to increase faster than the 50% rise projected for steel. Other uses of nickel included alloying

²⁰⁹ *Minerais et Metaux, op. cit.*, p. 108.

²¹⁰ *Inco Brief*, p. 18.

²¹¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 557.

²¹² *Ibid.*, p. 564; and *Inco Brief*, p. 38.

²¹³ United Nations, *Commodity Trade Statistics*, January-December 1955. Part of the nickel production of New Caledonia goes to Japan for smelting (*Inco Brief*, pp. 13-14).

with cast iron and non-ferrous metals, use in unalloyed form, in plating and as chemical agents. These uses were expected to grow at a rate similar to that in alloy steels.²¹⁴

The Western Hemisphere was held in the Report to have ample reserves of nickel, account being taken of the lateritic ores of Cuba where operations were being resumed, and of the unexploited deposits — chiefly laterites and low-grade silicates — in Brazil and Venezuela, and also in Tanganyika, Celebes, Borneo and the Philippines. While the deposits in the Sudbury district constituted by far the largest concentration of nickel in sulphide ores known in the world, the lateritic ores — rock formations, rotted by the weather of the tropics — were the world's greatest potential sources of nickel and chromium, as well as being rich sources of iron and cobalt. These ores had been used as a source of iron from time to time and currently, as in the war, were being used as a source of nickel. If metallurgy could solve the problem of how all four of the metals, or even three or two of them, could be economically recovered in one operation, they would become commercial sources of great importance. Cuba, for example, was estimated to have reserves of 25 million tons of nickel as compared with four million tons for Canada. In the face of the metallurgical problems, however, nickel, like most non-ferrous metals, was regarded as scarce in relation to its use and it was felt that the projected requirements for 1975 would be difficult to meet.²¹⁵

In examining the situation with respect to nickel, the United States Bureau of Mines reached the conclusion that "world production of nickel for many years will, as in the past, continue to come chiefly from Canada, where expansion programmes have been under way". United States dependence on imports could be reduced if further exploration of certain sulphide deposits disclosed substantially larger reserves and an economic process was developed for treating extremely low grade nickeliferous iron ores. But, despite the fact that there were enormous potential reserves of nickel throughout the world, economic ore deposits were exceedingly rare. The Sudbury district provided a notable exception. Whether or not Cuban nickel could compete in a peacetime economy would still seem to depend on the economic recovery of the associated minerals or on the development of an improved and lower-cost method for extracting nickel.²¹⁶

According to the Bureau of Mines study, the foremost problem confronting the nickel industry was the great disparity between peace and war requirements. The recent expansion programme in Canada, in the United

²¹⁴ *Paley Report*, Vol. II, pp. 25-26. On p. 9 of Vol. I, it is indicated that the projected doubling of demand for nickel refers to new material exclusive of scrap. With respect to the relative growth in the demand for nickel and steel, the *Inco Brief* indicated on p. 50 that the U.S. consumption of nickel since 1935 had increased only slightly more rapidly than steel production.

²¹⁵ *Ibid.*, Vol. I, pp. 91, 93 and 135; Vol. II, pp. 26-27; and Vol. IV, pp. 2 and 11.

²¹⁶ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 557, 560 and 567. The quotation is from p. 567.

States and in the United States Government facilities in Cuba meant that the capacity to produce nickel would exceed peacetime needs, *i.e.*, needs following the fulfilment of the United States stockpile objective. Nevertheless, new uses were being developed and would have peacetime application. The industry's aggressive research would also enlarge peacetime uses, although restrictions and the recent emphasis on scarcity had retarded the development of additional markets. Within 10 to 15 years, it was believed, markets would be found for most of the output of the current defence programme. Scarcity had meant the development of substitutes, but many of these had not proved wholly satisfactory. With plentiful supplies, users would return to nickel and downgrading would become unnecessary.²¹⁷

The brief presented to the Commission by International Nickel stated that it was estimated that 40% of the free world's available supply of nickel was currently absorbed by defence and United States stockpiling requirements. It was noted that a United States source on government procurement requirements published on March 31, 1955, gave a figure for nickel of 840 million pounds, 390 million pounds contracted for at over-market prices and 450 million pounds at market prices. The brief then quoted from a United States Department of Commerce review of nickel in the United States dated December 1955. *Inter alia*, this review stated that to use the nickel supply anticipated on completion of stockpiling, consumption would have to rise by 50%.²¹⁸

The projection in the Paley Report was for a 100% increase in United States and other free world nickel consumption over the period 1950 to 1975. Projected another five years, this would mean consumption in 1980 at about 130% above the 1950 level. Since 1950, however, total free world production as well as Canadian production and exports have risen much more sharply than this long-term rate of growth would imply. Between 1950 and 1955 the volume of Canada's exports rose by 43%. Despite the increase in production, supplies have been tight and many instances of prices far above that quoted by International Nickel have been reported. The United States Bureau of Mines, however, was worried about non-defence uses in the future, although it seemed relatively optimistic about the ability of the industry to create markets.

Recently, however, there have been optimistic forecasts of the future of world demand for nickel. The United States Department of Commerce and Office of Defense Mobilization are stated to have reported to Congress that, between 1955 and 1960, free world production would rise by 40%. Such an increase, however, would still be primarily to meet defence requirements.²¹⁹ A similar increase has been suggested by the chairman of the

²¹⁷ *Ibid.*, pp. 557, 564, 567 and 568. See *Inco Brief*, pp. 32-34 and 43-46 for a discussion of the competition of other materials with nickel.

²¹⁸ *Inco Brief*, pp. 22-25. In June 1956, it was reported that the U.S. stockpiling programme had reached only 50% of its objective (*The Financial Post*, Toronto, June 9, 1956).

²¹⁹ *The Financial Post*, Toronto, September 22, 1956.

board of International Nickel.²²⁰ The Vice-President and General Manager of Falconbridge predicted that world consumption in 25 years would rise to one billion pounds annually (perhaps double 1955 production). Such an increase would require the equivalent of a new International Nickel Company every 14 years.²²¹ In any event, the demand anticipated has been such as to lead International Nickel to announce the development of new mines and processing plants in the Mystery-Moak Lakes area of Northern Manitoba and it is reported that this, together with progress under way at Sudbury, will increase Inco's nickel producing capacity by about 130 million pounds or 50% (of which some 24 million pounds will replace existing temporary premium-priced production for the United States stockpile).²²² It is also reported that one of the new mines has an ore grade above that at Sudbury.²²³ In addition to this development, the press has reported very active search for new supplies and has indicated some success, as in the northern Ungava district of Quebec.²²⁴ Further, there have been reports of export contracts or offers with prices at substantial premiums being received by smaller producers.²²⁵

While it appears likely that Canadian nickel supplies will continue adequate for almost any non-war situation over the next 25 years, supplies available from non-Canadian sources are difficult to judge. Presumably the metallurgical problem of the lateritic ores will be overcome, although it is impossible to say when. Similarly, it is not possible to foretell whether the costs of production for nickel from this source will be above or below Canadian costs.²²⁶ Over the long run, however, it would appear necessary to assume that the Canadian share of the world export market will decline. How rapid such a decline is likely to be is a matter of considerable uncertainty.

Another area of uncertainty relates to the future of nickel prices. In December 1956, International Nickel announced an increase in the price by 9.5c., to 74c. a pound. But, as has been noted, there have long persisted premium prices substantially above this level. Yet what will happen when stockpiling activity ceases is difficult to predict.

For 1980 it is suggested that Canada's nickel exports might grow in value to something like \$350 million or more than 60% above the 1955

²²⁰ *The Gazette*, Montreal, January 15, 1957.

²²¹ *The Globe and Mail*, Toronto, September 14, 1956; and *The Financial Post*, Toronto, October 20, 1956.

²²² *The Gazette*, Montreal, December 6, 1956.

²²³ *The Globe and Mail*, Toronto, December 24, 1956.

²²⁴ *The Financial Post*, Toronto, December 29, 1956, and January 5 and 26, 1957; and *The Gazette*, Montreal, January 12, 1957.

²²⁵ *The Financial Post*, Toronto, October 20, 1956; and *The Gazette*, Montreal, December 14, 1956, and January 11, 1957.

²²⁶ Falconbridge Nickel Mines, Limited, has indicated an interest in lateritic ores in the Dominican Republic (*The Financial Post*, May 12, 1956). See also Royal Commission on Canada's Economic Prospects, *Hearings*, pp. 4984-4987.

level. The various uncertainties reviewed in this section mean that the figure is reached with considerable hesitancy.

20. Precious Metals (Excluding Gold)

(a) General Export Position

The value of Canada's domestic exports of precious metals other than gold rose from a prewar peak of \$23 million in 1938 to \$49 million in 1951. Subsequently the figure has been somewhat lower; in 1955 exports amounted to \$47 million. As is indicated in the following table, these exports consist largely of platinum metals contained in concentrates or other forms, silver bullion and silver in ore and concentrates.

The table shows that exports of platinum and other metals of the platinum group (palladium, rhodium, iridium, etc.) have become relatively more important since 1937. Quantity data are not given for these exports, but in value they rose from \$8 million in 1937 to \$26 million in 1955. In 1937 exports of platinum and platinum metals went largely to the United Kingdom; in 1955 the United Kingdom accounted for 55% of these exports and the United States for 44%. Exports of silver, which have increased slightly in volume and have about doubled in value, went largely to the United States in both 1937 and 1955.²²⁷

Canada's Domestic Exports of Precious Metals (Excluding Gold)
(thousands of Canadian dollars)

	1937	1954	1955
Jewellers' sweepings and scrap	1,338	1,395	1,119
Platinum and other metals of the platinum group in concen- trates, etc.	8,375	27,630	26,303
Old and scrap platinum	28	10	12
Silver in ore and concentrates	2,567	6,961	4,858
Silver bullion	6,556	11,992	14,485
Silver manufactures, n.o.p.	n.a.	54	54
Total	18,865	48,042	46,832

(b) Canadian and World Production

Nearly all of the platinum group metals produced in Canada come from the nickel-copper ores in the Sudbury area. Production has risen in the postwar period. In 1955, 170,000 fine ounces of platinum were produced, as compared with 122,000 ounces in 1946. For the other platinum metals, 1955 production of 214,000 fine ounces compared with 118,000

²²⁷ Between the first ten months of 1955 and the same period in 1956, exports of this group of metals rose from \$39 million to \$47 million, a change accounted for almost entirely by an increase in the value of platinum and the platinum metals.

ounces in 1946. In 1956, however, production of platinum was down to 150,000 ounces and that of the other metals fell to 162,000 ounces.²²⁸

Data published by the United States Bureau of Mines showed that Canada has been the world's most important producer of the platinum group metals. In 1952, the most recent year for which data were published in the Bureau's recent study, Canadian production accounted for 41% of the estimated world total. Next came the Union of South Africa with 35%, the U.S.S.R. with an estimated 15%, and the United States and Colombia with about 5% each. Between 1952 and 1955 Canadian production increased by 38%, but between 1952 and 1956 the increase was only 11%.²²⁹

Canada's maximum annual output of silver occurred in 1910 when 32.9 million ounces were produced. In 1940 production amounted to 23.8 million ounces and, after a wartime decline, it increased to 31.1 million ounces in 1954 but dropped to 28.0 million ounces in 1955 and 28.8 million ounces in 1956. According to data from the Annual Report of the American Bureau of Metal Statistics published by the D.B.S., Canada was the third most important producer of silver in 1953 when Mexico produced 22% of the estimated world total, the United States 16%, Canada 13%, the U.S.S.R. an estimated 11.5%, Peru 9% and Australia 6%.²³⁰

(c) *Market Outlook*

The Paley Report estimated that United States consumption of platinum might increase by 30% between 1950 and 1975. Platinum was listed among the minerals where there were little or no known United States economic reserves, where significant discoveries were not expected, and where significant beneficiation or synthesis was not expected. About 90% of United States consumption of the platinum metals was imported.²³¹

The study by the United States Bureau of Mines stated that South Africa was expected to lead substantially in the production of platinum group metals in the near future.²³² Available data indicated that Canada had reserves of about 6.5 million ounces of platinum group metals in copper-nickel ores, which would be produced during the next 20 years and that about 45% of this output would be platinum and the balance largely palladium. Recoverable reserves of 10 million ounces in Africa appeared to be a reasonable expectancy. Reserves in the Soviet Union were estimated

²²⁸ D.B.S., *The Nickel-Copper Mining, Smelting and Refining Industry, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²²⁹ *Ibid.*; and U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 700. It is suggested in the following subsection that Canada is no longer the largest producer.

²³⁰ D.B.S., *Annual Report on the Mineral Production of Canada, 1945*, p. 94; *Preliminary Report on Mineral Production, 1955*, *The Silver-Lead-Zinc Mining Industry, 1954*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²³¹ *Paley Report*, Vol. I, pp. 24, 26 and 157.

²³² In January 1956, the President of International Nickel stated that South Africa was probably a more important producer of platinum metals than was Canada (Royal Commission on Canada's Economic Prospects, *Hearings*, p. 4962).

to amount to some four million ounces. As regards Canadian production, it was noted that the principal producer, International Nickel, shipped its crude platinum-bearing products to a subsidiary plant in England for reduction to refined metals. The greater proportion of the output was returned to Canada, whence most of it was exported to the United States. A minor part of the Canadian output of platinum metals was produced by Falconbridge and refined in Norway.²³³

The Bureau of Mines study also stated that, during the years 1941 to 1952, United States production of primary platinum group metals averaged only 7% of domestic consumption. Unless new deposits were discovered in the early foreseeable future this would decline to about 2%. The world outlook for platinum group metals was for greater production and consumption. During the past 20 years, the annual consumption of platinum metals in the United States for decorative uses had increased roughly twofold and that for industrial uses, fourfold. The production trends seen were for declining output in the United States and Colombia, slightly greater output in Canada, and moderately greater output in the Union of South Africa. Additional output was also possible in Southern Rhodesia and Ethiopia.²³⁴

In 1954 when Canadian silver production reached the highest level in recent years, 69% was produced from silver-lead-zinc ores, 13% from copper-gold-silver ores, 4% from nickel-copper ores, 2% from auriferous quartz ores, and 12% from silver-cobalt and other ores. Thus Canadian silver, like the platinum metals, is produced largely as a by-product or co-product.²³⁵

The study by the United States Bureau of Mines noted that, since 1933, United States output of newly mined silver had been bought by the United States Treasury at fixed prices. Normally, the domestic supply of silver for industrial needs consisted of imports and secondary production purchased at open market prices, sources which were adequate for trade requirements. As it seemed logical to anticipate that, in an emergency, legislation would be enacted to release silver for military needs from the vast stocks in Treasury holdings, no shortage of silver in the United States was felt to be in prospect. No duties were imposed by the United States on the import of silver in ores, bullion or coins, but silver manufactures were subject to duties ranging from 17.5% to 55%. Unlike most other metals, the postwar production of silver in the United States and the world had been below prewar. Consumption and average prices, however, had been higher. The increasing proportion of silver being consumed in industry and the arts promised a more dependable demand than when politically controlled monetary uses predominated. Continuance of international tension and

²³³ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 696 and 698.

²³⁴ *Ibid.*, pp. 695 and 701-702.

²³⁵ D.B.S., *The Silver-Lead-Zinc Mining Industry, 1954*, p. 9.

maintenance of strong industrial activity would sustain the production and consumption of silver at levels somewhat higher than would otherwise be so.²³⁶

Despite the somewhat pessimistic views expressed in the study by the United States Bureau of Mines, it is felt that Canadian production of both the platinum metals and of silver can increase and that exports should rise by about 50% between 1955 and 1980. Accordingly, exports of precious metals other than gold are projected as growing from \$48 million in 1954 and \$47 million in 1955 to \$75 million in 1980.

21. Uranium

(a) Canadian Production and Exports

While export data on uranium are not yet published, the D.B.S. has reported that production was valued at \$26 million in 1955 and \$40 million (preliminary) in 1956.²³⁷ All uranium produced is exported in the form of oxide to the United States Atomic Energy Commission and it would appear that 1955 exports can be put at about \$25 million. Mr. W. J. Bennett, President of Eldorado Mining and Refining Limited and of Atomic Energy of Canada Limited, stated in October 1955, that it was estimated that the rate of uranium production in Canada at the end of 1955 would be eight times as great as it was at the end of the war.²³⁸

(b) Sales Arrangements

In March 1948, Eldorado Mining and Refining Limited, a Crown company, was made responsible for the procurement of all uranium produced in Canada. Under the purchase policy there has existed, first, a guarantee that Eldorado would purchase all uranium which was offered under a published price schedule and, second, a guarantee that Eldorado would purchase uranium under a special price formula. In the latter case, the guarantee was subject to certain conditions — that applications for special price contracts would be submitted by March 31, 1956, and assurance that production would commence not later than September 30, 1957. All purchases made to mid-June 1956 had been made under the special price formula and it appeared at that time that this situation was likely to continue. By mid-June 1956, special price contracts had been written for a total value of about \$700 million and it was expected that the amount would reach more than \$1,250 million when the negotiation of contracts

²³⁶ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 790-792.

²³⁷ D.B.S., *Preliminary Estimate of Canada's Mineral Production, 1956*. It is anticipated that the D.B.S. will soon be publishing data on uranium exports which increased substantially in 1956.

²³⁸ *The Atomic Energy Programme in Canada*, address by W. J. Bennett, President, Atomic Energy of Canada Limited, to Annual Meeting of National Industrial Conference Board in New York, October 27, 1955.

in process had been completed. Deliveries under both purchasing arrangements, however, were to terminate on March 31, 1962.²³⁹

Subsequent press reports have suggested that, if production from Eldorado's own mines is taken into account, total contracts will be near, and may exceed, \$1.6 billion. In October 1956, it was reported that, in order to provide a full write-off of preproduction and capital expenditures for certain producers, the quantities in the contracts would be increased and the termination date for deliveries of the total contract quantity would be extended to March 31, 1963. These increases and \$202 million reported for Eldorado raised the total to nearly \$1.6 billion. In addition, one contract was reported without an amount being stated.²⁴⁰

On May 24, 1956, it was announced that the United States Atomic Energy Commission would continue its uranium purchasing programme from the previous expiration date of April 1, 1962, to December 31, 1966. The next day, the Minister of Trade and Commerce stated in the House of Commons that it was not the intention of the government to extend the Canadian uranium-buying programme at that time. He reminded the House that there was a limit on the amount of uranium which the United States Atomic Energy Commission would wish to purchase from Canadian sources. The situation in that respect had not changed. The Minister noted, however, that the special price contracts contained a clause which provided that the purchaser would have an option to extend the contracts after March 31, 1962. Every effort would be made to clarify the position with respect to the exercise of these options at the earliest possible date. The government was anxious to ensure that the industry would have continuing markets beyond March 31, 1962. Negotiations were currently under way whereby the United Kingdom would obtain from Canada part of its requirements of uranium, to be supplied under an arrangement similar to that which prevailed with the United States Atomic Energy Commission. The quantities involved would be supplied from the contracts which would be entered into under the existing special price arrangement. As regards exports to other countries, the government would take under consideration the establishment of an export policy for uranium. It was, however, considered desirable that the establishment of policy for export of more than research quantities should await the outcome of the discussions at the United Nations conference in September 1956.²⁴¹

²³⁹ Eldorado Mining and Refining Limited, *Annual Report, 1954*, p. 7; and *The Atomic Energy Programme in Canada*, address by W. J. Bennett, President, Atomic Energy of Canada Limited, to the Annual Meeting of the Investment Dealers' Association of Canada at the Algonquin Hotel, St. Andrews-by-the-Sea, N.B., June 15, 1956.

²⁴⁰ *The Globe and Mail*, Toronto, September 10, 1956; *The Financial Post*, Toronto, October 13 and November 3, 1956; and *The Gazette*, Montreal, October 25 and December 13 and 14, 1956.

²⁴¹ *House of Commons Debates, Official Report*, Friday, May 25, 1956, pp. 4325-26. An article in *The Financial Post*, Toronto, of June 2, 1956, stated that the total of the first contract with the United Kingdom would probably amount to only about 10% of Canadian "special contract" sales.

In October 1956, agreement was reached on an International Atomic Energy Agency under the aegis of the United Nations.

(c) Canadian Reserves

In October 1955, the president of Atomic Energy of Canada Limited pointed out that most of the new mines which had been discovered in Canada had very large ore reserves. Even at the projected rates of daily production, these mines would be long-lived. This was in contrast to the position in the United States where it had been stated that reserves might well be exhausted by the early 1960's if the existing level of exploration and development was not maintained. While the major discoveries had been made in two districts — the Beaverlodge district of northwestern Saskatchewan and the Blind River district of Ontario — Canada still had immense areas of unexplored ground which were geologically favourable to the occurrence of radioactive minerals. Thus there was no doubt that current estimates of production could be greatly exceeded if there were a market for additional production.²⁴²

In addition to the Beaverlodge and Blind River districts, uranium is produced in the Northwest Territories, and contracts have been awarded to producers in the Bancroft area of eastern Ontario. A *Financial Post* map also showed uranium occurring in the Kamloops area of British Columbia, the Kenora area of Ontario and in Labrador. The Premier of Newfoundland is reported to have stated that geologists had rated the Labrador potential beside those of Beaverlodge and Blind River. If the work came up to expectations, mining of uranium ore and processing of its concentrates could commence in 1957.²⁴³

In December 1956, information on reserves and production was declassified. On the basis of known information, Eldorado Mining and Refining Limited estimated that Canada's reserves were 225 million tons of ore with a uranium content of 237,000 tons. As at December 31, 1956, Canadian uranium production would be at the rate of 3,300 tons a year. This production would be contained in a high-grade concentrate. By mid-1958 the rate was expected to be between 14,000 and 15,000 tons per year.²⁴⁴ The estimate of ore reserves of 225 million tons is probably conservative. Unofficial sources have suggested that the Blind River district alone may have a potential substantially in excess of this figure.

(d) Canada's Position in World Production and Trade

The recent study of the United States Bureau of Mines listed known uranium deposits of geologic significance in the Belgian Congo, Mozambique, Southern Rhodesia, the Union of South Africa, the Northern Territory of Australia, South Australia, Canada's Northwest Territory, the Blind River district, the Beaverlodge area, Czechoslovakia, France, England,

²⁴² W. J. Bennett, address of October 27, 1955, cited earlier.

²⁴³ *The Financial Post*, Toronto, March 3, 1956; and *The Ottawa Journal*, February 16, 1956.

²⁴⁴ Eldorado Mining and Refining Limited, *Press Release*, December 13, 1956.

Portugal and a number of areas in the United States. It was stated, however, that some of the deposits noted in the United States were not extensive and might soon be mined out. The study also pointed out that the United States was not self-sufficient in uranium resources and imported sizable amounts of uranium ores and concentrates from the Belgian Congo, Canada, the Union of South Africa, and possibly other countries.²⁴⁵

Canadian uranium production appears so far to have been at a smaller rate than that in either the United States or the Union of South Africa. It has been announced that United States production in December 1956 was at an annual rate of 8,000 tons of U_3O_8 as compared with 3,300 tons for Canada.²⁴⁶ In the first 11 months of 1955, South African shipments of prescribed material (uranium and thorium) were valued at £26 million.²⁴⁷ Officially announced Canadian reserves, however, are greater than those announced for the United States — 225 million tons with a uranium content of 237,000 tons as against 60 million tons with a content of 150,000 tons. Canada's supplies and expected Canadian production bulk very large in the world picture.

(e) *The Outlook*

The United States Bureau of Mines has stated that commercial application of nuclear power might become commonplace in ten years. In addition, it saw increasing interest in the application of radioisotopes to industrial, agronomic and medical problems. Non-energy uranium requirements, however, were small and probably would not increase significantly. Uranium demand after 1962, the end of the period of guaranteed purchasing at the time that the study was written, could not be foreseen, "although in every respect the future seems most encouraging". Should applications for nuclear energy in propulsion become widespread in the next five to ten years, they might in themselves offset any decline in the demand for uranium that might develop in weapons production. Great strides had been made in the preliminary investigations of nuclear reactor application to industrial power generation. Studies by the Atomic Energy Commission and by large industrial firms indicated that within ten years nuclear power would be competitive, at least in high cost power areas. In attempting to utilize the great energy potential of uranium, however, industry faced indeterminate long-range problems of availability and price. The threat of a major war made doubtful the future supply of fissionable material for industrial purposes. Some immediate problems of industry and the armed forces in developing power and propulsion reactor systems related to efficient structural and coolant materials. It was regarded as significant that some materials most difficult to handle had proved most applicable to reactor con-

²⁴⁵ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 947-948 and 949.

²⁴⁶ United States Atomic Energy Commission, *Press Release*, December 13, 1956; and Eldorado Mining and Refining Limited, *Press Release*, December 13, 1956.

²⁴⁷ International Monetary Fund, *International Financial News Survey*, Washington, D.C., May 4, 1956 — based upon *The Star*, Johannesburg, March 9, 1956.

struction. Reduction of mass in shielding required to protect persons from the radioactivity of the reactor fuel system would appear to be exceedingly important if reactors were to have practical use in propelling aircraft, automobiles and trains. Also important were the property and insurance requirements involved in a central power station utilizing fissionable material for fuel. Federal, state and local legislation might necessitate such expensive property and insurance precautions as to make the costs of atomic power plants prohibitive.²⁴⁸

As has been noted above, the president of Atomic Energy of Canada Limited stated in June 1956, that it was expected that special price contracts would be in excess of \$1.25 billion when negotiation of contracts in process had been completed. This meant that the gross value of Canada's uranium sales, when all of the mines including Eldorado's mines were in full production, would be at the rate of approximately \$300 million per year.²⁴⁹ The same figure of approximately \$300 million per annum was employed in Eldorado's December 1956 press release giving data on reserves and production.

Turning to the question of probable markets beyond March 31, 1962, in his June 1956 address, Mr. Bennett recalled that the main objective of Canada's uranium programme was the supply of uranium for military projects. There was no information available at that time as to what the level of demand for military purposes would be after March 31, 1962. There might, however, be some significance in the fact that the U.S. Atomic Energy Commission had extended its domestic buying programme to the end of 1966. While the primary purpose of this extension was to develop new ore reserves to replace present reserves, it also indicated that the United States foresaw a substantial demand for uranium beyond 1962. Mr. Bennett did not know what part of this demand would be for military uses and what part would be for civil uses, nor did he know whether the demand would be such as to require heavy imports of uranium beyond 1962.²⁵⁰

As regards the probable demand for uranium for civil purposes, it was possible to predict that nuclear power could and would be used. But even if it were possible to arrive at a reasonably accurate estimate of the amount of nuclear power which would be generated in a given region by 1965, it would still not be possible to forecast the amount of uranium requirements for this power, since this would depend on the type of power reactor and fuel system used. Power reactors differed in many ways but they differed particularly in the amount of energy which could be extracted from a ton of uranium, or what was commonly called the difference in the burn-up factor. If it were possible to utilize all of the heat potential of a ton of natural uranium, the requirements of uranium for a nuclear power pro-

²⁴⁸ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 945, 949 and 950-951.

²⁴⁹ W. J. Bennett, address of June 15, 1956, cited earlier.

²⁵⁰ Suggesting reduced demand, an article in *The Financial Post*, Toronto, of December 3, 1955, noted U.S. opinion that weapons production might be cut back because of the size of the stockpile accumulated.

gramme would be very small. There were, however, physical limitations and cost limitations which stood in the way of the full utilization of the heat potential of a ton of uranium. In order to obtain a high percentage of burn-up, it was necessary to use the unburned or depleted uranium and the plutonium in the spent fuel element. This could be done by extracting from the spent fuel element in a chemical process the unburned or depleted uranium and the plutonium and by re-entering these into the fuel system of the reactor. This was called recycling. Theoretically it was possible to continue this recycling until all of the heat potential of the original fuel had been utilized. However, the cost of chemical processing placed some limits on the number of recycles which might be economic. There were a number of possible approaches to reactor design which ranged from what was called a single-pass reactor (one in which no recycling was done) to a fast breeder reactor which produced more fissionable material in the form of plutonium than it consumed. No one could yet say which type of reactor would produce the lowest cost per kilowatt-hour.

In considering the future market for Canadian uranium, three periods may be distinguished. The first period, running until 1962 or 1963, is characterized by assured sales for military purposes. The second period, from 1962-63 until 1970 or 1975, is one of considerable uncertainty. Civilian uses for uranium are not expected to approach mine capacity, and prospects during this period are largely dependent upon military uses. The third period, which is expected to begin in the 1970's, may be called "the age of atomic power". Assuming no major war, the demand for uranium during this period will presumably be based largely upon civilian uses.²⁵¹

In an address in March 1956, Mr. Bennett analyzed the findings of United Kingdom, United States, and Canadian documents as they affected the requirements of uranium for power programmes.²⁵² *The Financial Post* derived the following table from Mr. Bennett's presentation.

Forecasts of Uranium Requirements for Power Generation
(tons of uranium)

	Canada	U.K.	U.S.
1965			
Maximum.....	130	600-700	2,550
Minimum.....	38	300-350	680
1975			
Maximum.....	450	800	41,000
Minimum.....	290	440	11,000

NOTES: (1) All figures include inventory additions for new reactors, as well as replacement for "burn-up".

(2) Some recycling is assumed in all three countries. U.K. minimum use allows for a tenfold increase in "burn-up" by 1965 and a hundredfold by 1975. The U.S. figures assume a combination of six different reactor types in use.

SOURCE: *The Financial Post*, Toronto, March 10, 1956.

²⁵¹ *The Financial Post*, Toronto, March 10, 1956.

²⁵² *The Atomic Energy Programme in Canada*, address by W. J. Bennett, President, Eldorado Mining and Refining Limited, to Prospectors and Developers Association, Toronto, March 6, 1956.

In another article in the same issue, *The Financial Post* drew certain conclusions. The United States was the only country which could provide a civilian market for anything like all the uranium Canada would be able to produce 10 or 20 years from now and, even by 1975, it might not need (for civilian purposes) anything like all Canadian production. It was estimated that, if contract prices averaged about \$10 a pound of uranium oxide, then \$250 million a year would mean production of about 10,000 short tons a year of uranium during the contract period. (As has been noted above, the gross value of uranium sales in the contract period has subsequently been put at the rate of approximately \$300 million per year.) This approximated the low estimate given for United States civilian purposes in 1975. It was nearly four times as great as the high estimate for 1965. If the low estimate for 1975 turned out to be the most nearly correct, Canada would need a monopoly of the United States market. If, however, United States demand were nearer the high estimate, then the 1975 market would look attractive, at least for presently planned production. The *Post* then asked if it were likely that the United States would insist on keeping its own mines going even if they were higher cost producers than those in Canada, South Africa or the Belgian Congo. While it could be argued that public demand for the cheapest possible power would compel the United States to seek the cheapest possible atomic fuel, the fuel cost would be a very small part of the total cost of an atomic power plant. The *Post* also noted that other demands were small beside those of the United States. In terms of fuel requirements, it was thought that the rest of the world might not even double the United Kingdom requirement by 1975.²⁵³

Translating all this into a forecast of exports in 1980 is exceedingly difficult. Assuming that there in fact exist substantial potential reserves, there would appear to be no difficulty in Canada's exporting the amount of uranium which will be demanded. The question is what will be the demand. It would seem to be at least a possibility that the price of uranium oxide will fall below the \$10 a ton approximate figure which has been suggested for the present contracts. With the mills written off, Canada could readily continue to export uranium even if there were a price reduction. As little more than a wild guess, it is here suggested that exports in 1980 will run at something like the same volume as under the present contracts and that there will be some fall in price, so that the value of Canada's exports in 1980 would be about \$200 million. It may be further suggested that, of these exports, perhaps \$170 million might go to the United States and the balance to the United Kingdom and other overseas countries.

Another possibility is that Canada might export uranium in metallic form and thus substantially increase the value of her exports. Eldorado Mining and Refining Limited has decided to construct a uranium metal plant with an initial capacity sufficient to meet Canada's requirements of

²⁵³ *The Financial Post*, Toronto, March 10, 1956. See also the same source, issue of June 2, 1956.

uranium metal. The plant is expected to be in operation in late 1957.²⁵⁴ It is possible that Canada's hydro power might be used 25 years hence to produce very large values of metal or U-235, particularly for the United Kingdom. In view of the 'uncertainties, including those related to the payments positions of overseas countries, however, no specific projection is suggested for such exports. Nor is account taken of the export of the by-products of Canada's atomic energy programme. Atomic Energy of Canada's NRU reactor was expected to produce substantial quantities of plutonium which would be sold under contract to the United States Atomic Energy Commission. It would also produce large quantities of isotopes, notably Cobalt-60.²⁵⁵

22. Zinc and Products

Canada's domestic exports of zinc approximately doubled in volume between the late 1920's and 1937, and almost doubled in value, to reach \$15.5 million in the latter year. Between 1937 and 1952 the volume of exports again doubled and the value rose to \$97 million. Subsequently the volume continued to rise but prices fell, so that in 1955 exports amounted to 410,000 short tons and were valued at \$71 million.²⁵⁶ Fifty-two per cent of the volume of these exports and 67% of the value consisted of zinc spelter or slab zinc, lower percentages than in the late 1920's and late 1930's but above those of 1952. Most of the remainder consisted of zinc contained in ore, although there were minor quantities of zinc scrap, dross and ashes, and zinc manufactures.

In the late 1930's, the United Kingdom was much the most important export market for Canadian zinc. Next in importance were Belgium-Luxembourg and Japan, with the United States taking relatively small quantities. Since the war, the United States has been much the most important market, with the United Kingdom in second place. In 1955 the United States took 67% of Canada's exports of zinc and products and United Kingdom 29%. Next in importance was Belgium-Luxembourg which purchased only 1.4% of these exports. Sales to the United States accounted for most of Canada's exports of zinc contained in ore and for somewhat more than half of the zinc spelter. The United Kingdom's purchases were largely zinc spelter and those of Belgium-Luxembourg largely in the form of ore.

Canada's output of zinc has increased more or less parallel with exports. Between 1929 and 1937, production rose from 99,000 short tons to 185,000 tons. In 1955 it was at the all-time high level of 433,000 tons and in 1956 amounted to 424,000 tons. In 1954, 30% of Canadian zinc production was recovered from copper-gold-silver ores, and the balance from silver-lead-

²⁵⁴ Eldorado Mining and Refining Limited, *Annual Report, 1955*, p. 8.

²⁵⁵ Atomic Energy of Canada Limited, *Annual Report, 1955-56* (year ended March 31, 1956), pp. 4 and 6.

²⁵⁶ Between the first ten months of 1955 and the same period in 1956, the volume of exports fell from 339,000 tons to 314,000 tons but the value rose from \$58.6 million to \$59.3 million.

zinc and other ores. According to data from the Annual Report of the American Bureau of Metal Statistics, Canada is the world's second most important producer of zinc ore. Of the total reported for 1954, the United States produced 17%, Canada 13%, Australia 11%, and the U.S.S.R. and Mexico 9% each, the figure for the U.S.S.R. being an estimate.²⁵⁷

The Paley Report anticipated that, between 1950 and 1975, United States demand for zinc would increase by about two-fifths and that of the rest of the free world by about three-fifths. Since little increase was expected in United States production, this would mean that production in other free countries would have to rise by seven-eighths. The details of these expectations are indicated in the following table.

Under favourable circumstances, the zinc outlook for the next quarter century, unlike that for copper and lead, was expected to be adequate to meet the growth in demand with little or no increase in real zinc costs. Production from the large submarginal reserves believed to exist in the

Zinc Position, 1950, and Projected, 1975

(thousands of short tons)

	1950	1975
United States		
Consumption (actual).....	1,156	1,600(a)
Production — mine.....	618	700(a)
— secondary.....	75	100(a)
Net imports.....	382	800(b)
Other free world		
Consumption (new zinc).....	1,061	1,700(a)
Net exports to U.S.....	382	800(b)
Mine production.....	1,313	2,500(a)

(a) Estimated or projected.

(b) Required.

SOURCE: *Paley Report*, Vol. II, pp. 47-48.

United States and, inferentially, abroad could be induced by no more than a small increase in the price of zinc. A rise in price would also encourage greater substitution of other metals for zinc in such uses as galvanizing and die-casting.²⁵⁸ It is possible, however, that U.S. imports were understated in the projection. In recent years, production has been below the 1950 level, amounting in 1955 to about 506,000 tons.²⁵⁹

The United States Bureau of Mines stated that Canada had the world's largest zinc reserves on a national basis. Total reserves in the measured

²⁵⁷ D.B.S., *Annual Report on the Mineral Production of Canada, 1945*, p. 101; *Preliminary Report on Mineral Production, 1955*; *The Silver-Lead-Zinc Mining Industry, 1954*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²⁵⁸ *Paley Report*, Vol. II, p. 48. See also Vol. II, pp. 6, 44-49, 118, 121-122, 132 and 133.

²⁵⁹ U.S. Department of Commerce, *Survey of Current Business*, March 1956.

and indicated classifications were estimated at over 70 million short tons of metal, while developed reserves in Canada were estimated to contain 14 million tons of zinc. Partial information suggests that the world's total zinc in measured, indicated and inferred ore reserves approximated 200 million to 300 million tons. In addition there were doubtless very large quantities of metal in potential resources that were undiscovered or currently uneconomic. In contrast to the 14 million tons in Canada, United States reserves were suggested at 8.5 million tons of zinc content.²⁶⁰

World production of zinc in the period 1948 to 1954 was well over world requirements and consequently large stocks were accumulated. Much of the excess production was shipped to the United States, where accumulating stocks and the prospects of still more imports brought about unusually low prices and the closing of many mines. World consumption of primary slab zinc averaged 1,975 tons annually in the years 1946-53 and increased 39% over the period, while world output of slab zinc in the same years averaged 2,042 tons and increased 65%. The high level of imports and the depressed state of the United States zinc and lead mining industry stimulated much study of various protective tariff proposals and other plans to aid the industry. Although a report on the "escape-clause" provisions of the Trade Agreements Extension Act in 1954 recommended that import duties on most lead and zinc materials be increased 50% above the rates existing on January 1, 1945, the President did not accept the recommendations of the Tariff Commission. Instead he outlined an expanded stockpiling programme for strengthening the lead and zinc industry. In the second half of 1954, resumption of United States stockpiling and increased world consumption tended to alleviate the situation somewhat.²⁶¹

World reserves of measured, indicated and inferred zinc ores appeared to be adequate to meet foreseeable requirements for the next 40 years. World consumption would increase, requiring an annual mine output of about three million tons of zinc by 1965 compared to about 2.5 million tons at the time of writing.²⁶² United States reserves would permit continuation of current or somewhat greater domestic mine output for many years. It seemed probable, however, that a larger part of the supply would be met by imports, for requirements would increase greatly and the ratio of scrap generation to total consumption was declining. From 1955 to 1965, mine production could be expected to average 550,000 to 600,000 tons a year. Total distribution, including slab zinc consumption, direct consumption of ore in pigments and chemicals, consumption of secondary metal and exports,

²⁶⁰ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 977 and 992-993.

²⁶¹ *Ibid.*, pp. 978, 989, 997-999, and 1003.

²⁶² These figures appear to have been on a higher base than those in the Paley Report. In a table on p. 981, 1950 production is shown as 2.14 million metric tons (including 129,000 tons for the U.S.S.R.).

totalled about 1.37 million tons in 1953 and was projected to increase to 1.65 million tons by 1975.²⁶³

The volume of Canada's zinc exports rose by 46% between 1950 and 1955 and, especially in the light of recent discoveries in Canada, future increases are to be expected as world consumption increases. Further, because of increased consumption in the United States and an increasing deficit in that country, Canadian participation in world markets may be expected to increase. At the same time, however, the possibility of an increase in the United States tariff cannot be ignored. While additional refining capacity appears to be expected in Canada, with increased mine production of zinc, particularly from eastern Canada, the proportion of Canadian zinc exported as concentrates may increase unless new refineries are built in Canada. The desire to keep refining facilities in the United States operating at capacity may, however, mean pressure to import Canadian concentrates. European zinc demand is likely, in considerable measure, to be for concentrates rather than refined zinc. A substantial chemical industry has grown up around European smelters, particularly in Belgium, and it will be desired to keep the smelters operating to maintain supplies of sulphur for the chemical industry.²⁶⁴ In the light of these considerations, it is suggested that Canada's zinc exports might increase from \$71 million in 1955 to something like \$125 million in 1980.

23. *Other Non-ferrous Metals*

Excluding electrical apparatus for later consideration, the mixed bag remaining in the non-ferrous metal group in Canada's export statistics ranges from brass, the long-used alloy of copper and zinc, to such newer so-called wonder metals as titanium, lithium and columbium. Data on Canada's exports of these metals for the years 1937, 1954 and 1955 are given in the following table.

*Canada's Domestic Exports of Other Non-ferrous
Metals and their Products (a)*
(thousands of Canadian dollars)

	1937	1954	1955
Brass and products	1,615	6,172	7,849
Clocks and watches	465	833	693
Cobalt in ore	59	6	—
Molybdenite	n.a.	n.a.	873
Titanium slag	n.a.	n.a.	5,424
Tungsten ore and oxide	n.a.	n.a.	6,536
Ores, n.o.p.	28	11,604	1,833
Cobalt metal	11	3,778	3,462
Tin plate scrap	n.a.	745	828

²⁶³ *Ibid.*, p. 1002.

²⁶⁴ From January–October 1955 to January–October 1956, the volume of exports of zinc in ore rose by 9% while zinc spelter fell by 21%.

*Canada's Domestic Exports of Other Non-ferrous
Metals and their Products — (Continued)*

	1937	1954	1955
Metallic scrap, dross and ashes, n.o.p.	581	2,565	4,222
Cadmium	n.a.	1,208	2,275
Calcium	n.a.	n.a.	1,283
Magnesium	n.a.	n.a.	4,888
Selenium and salts	n.a.	1,944	2,556
Others	1,919	8,434	5,252
Total	4,678	37,289	47,974

(a) Excludes electrical apparatus, as well as aluminum, copper, lead, nickel, precious metals, uranium, zinc and their products.

Between the first ten months of 1955 and the same period in 1956, there was a further sharp increase in these exports, from \$38 million to \$52 million. Among the constituents, the most notable increases were from \$3.1 million to \$6.3 million for titanium slag; from \$0.9 million to \$5.3 million for ores, n.o.p.; from \$3.3 million to \$4.2 million for metallic scrap, dross and ashes, n.o.p.; from \$2.0 million to \$5.3 million for selenium and salts; and from \$4.4 million to \$8.1 million for "others".

For the group as a whole, about 60% of the 1955 exports went to the United States, while about 15% went to the United Kingdom. The only items for which the United States did not account for 50% or more of Canada's 1955 exports were brass and products, where the United States share was 49%; clocks and watches, where the Union of South Africa took 51%; molybdenite, where there were no exports to the United States and the largest share went to the United Kingdom; ores, n.o.p., which went largely to Norway; and magnesium, where over half of total exports went to the United Kingdom.

Cadmium is used mainly in electro-plating and in the manufacture of alloys and compounds. The use of cadmium alloys in motor vehicle bearings and for solders has created a strong demand for the metal. Cadmium is also used in the arts, paints, ceramics, dyeing, etc. Canada's production, which is recovered as a by-product of the electrolytic refining of zinc, grew from 373 tons in 1937 and about the same level in the immediate postwar years to 960 tons in 1955 and 1,129 tons in 1956. Production and exports increased sharply between 1954 and 1955, when exports were valued at \$2.3 million, as compared with \$788,000 in 1939. In 1954 Canada produced about 7% of the estimated world total cadmium production and ranked after the United States, with 61%, South-West Africa, Mexico and Belgium. The increase in production in 1955, however, may have been great enough to put Canada in second position.²⁶⁵

²⁶⁵ D.B.S., *Annual Report on the Mineral Production of Canada, 1945; The Miscellaneous Metal Mining Industry, 1955; Preliminary Estimate of Mineral Production, 1956; and Trade of Canada.*

The United States Bureau of Mines found difficulty in forecasting with any assurance the supply-demand picture for cadmium over an extended period. The most logical assumption, however, was that supply and demand would be in virtual balance during the ensuing decade with probable increases in both. Beyond a period of ten years, however, the demand for cadmium was expected to increase somewhat, with United States production remaining relatively stable owing to inelasticity of the industry. Thus the long-range view was one of tighter supplies, with greater United States dependence on foreign sources. Countries in which cadmium production would probably increase substantially included Canada, Peru, the Belgian Congo and North Africa. A large potential use for cadmium would seem to be in nickel-cadmium storage batteries. Cadmium was also used in nuclear physics to control the fissionable elements in reactors, and a possible use was in the conversion of sunlight into energy.²⁶⁶

Canadian *cobalt* has been produced from the silver-cobalt ores of Northern Ontario, from the nickel-copper ores of the Sudbury area and it was expected that it would be recovered from the nickel-copper ores at Lynn Lake. Not until recent years, however, has Canadian cobalt production equalled the 1.6 million pounds achieved in 1913. In 1937 production amounted to 0.5 million pounds; in 1955, it amounted to 3.3 million pounds, and in 1956 to 3.7 million pounds. Over three-quarters of the world's mine production of cobalt in 1953 was produced in the Belgian Congo. Other important producers were the United States, Canada, Northern Rhodesia and French Morocco. In addition to \$3.5 million of exports of cobalt metal, Canada's 1955 exports included \$2.9 million of cobalt oxides and salts included in the chemicals group.²⁶⁷

The United States Bureau of Mines stated that cobalt occupied an important position among the alloying metals owing to its ability to withstand high temperatures, its cutting efficiency and its magnetic properties. Because of progress in metallurgical research on extractive methods, only in recent years had it been possible to produce cobalt in quantity adequate to assure supplies for expanded applications. Reserves, however, were held to be sufficient to sustain new and increased uses. United States production of cobalt was expected to reach an annual rate of 5.3 million pounds by the end of 1955. It was also expected that additional production would soon be forthcoming from the newly developed deposits in Manitoba, Northern Rhodesia and Uganda. Recovery of cobalt from the lateritic ores of Cuba was held to be promising, and other sources could add substantially to the world supply. When the national stockpile objective was attained, the demand for cobalt would decline substantially. It was anticipated, however, that eventually consumption in the United States might reach 10 million

²⁶⁶ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 156-157.

²⁶⁷ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 208; and D.B.S., *Annual Report on the Mineral Production of Canada, 1945*, p. 89; *The Silver-Lead-Zinc Mining Industry, 1954*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

pounds annually, or slightly below the level in 1952 and 1953, and that usage abroad would also expand. Nevertheless, for many years, peacetime demand for cobalt would be substantially less than potential production.²⁶⁸

The Paley Report was much more optimistic about the future of cobalt, projecting that United States consumption would rise from nine million pounds in 1950 to 40 million pounds in 1975. Consumption in other free countries was expected to increase at about the same rate, from six million pounds in 1950 to 26 million pounds in 1975.²⁶⁹

Two rare metals generally considered together are *columbium* and *tantalum*. Columbium is essential in the manufacture of special high-temperature alloys and tantalum is equally important in the manufacture of electronic equipment. Although the press has suggested that columbium is one of the metals of Canada's future,²⁷⁰ it has been relatively unimportant to date. Tantalum and columbium concentrates from the Northwest Territories were treated at Cap-de-la-Madeleine and the resulting oxides exported for further treatment. In 1955 Canada's production of columbium pentoxide amounted to 42 pounds valued at slightly over \$1,000 — only one-half of the production in 1954. The 1955 production of tantalum pentoxide, however, was sharply up from 1954, amounting to 390 pounds with a value of close to \$10,000. A fire at the mine caused heavy damage and operations were suspended, so that no production of either metal was reported for 1956. Other firms, however, were continuing to develop the deposits containing columbium, tantalum and uranium at Oka, Quebec, and at Nipissing, Ontario.²⁷¹

The study by the United States Bureau of Mines was relatively brief on the outlook for columbium and tantalum. It suggested, however, that their high prices would probably drop sharply when the United States Government purchasing programme for foreign ores ended on December 31, 1956. The United States imported 99% of its consumption and the problem was to find ways to decrease the almost complete dependence of the United States on imports and stockpiling. Many thousands of tons of columbium in low grade deposits, such as the columbium bearing titanium deposits of Arkansas and the pyrochlore-type mineral deposits of Canada and Africa, presented a challenge.²⁷²

There was no recorded production of *lithium* minerals in Canada between 1937 and 1954. From 1925 to 1937, inclusive, an estimated 250 tons were produced and exported to the United States. Less than nine tons of lithium

²⁶⁸ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 203 and 211-12.

²⁶⁹ *Paley Report*, Vol. II, pp. 118 and 132.

²⁷⁰ See, for example, *The Financial Post*, Toronto, May 5, July 21, and September 22, 1956.

²⁷¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 213; and D.B.S., *The Miscellaneous Metal Mining Industry, 1955*; *Preliminary Report on Mineral Production, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²⁷² U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 217-18, 238

oxide or lithia were produced in 1954. Production then rose to 57 tons in 1955 and to 2,400 tons with a value of \$2.6 million in 1956.²⁷³ Thus, this commodity is again being exported.

According to the United States Bureau of Mines, measured reserves of lithium appeared to be relatively small compared with projected demand but numerous deposits, including those in Quebec and Manitoba, had not been thoroughly explored. Greater use of lithium in the lubricating field presented a large potential market. Lithium minerals and compounds were finding increasing use in glass and ceramics, air-conditioning, batteries, and pharmaceutical intermediates. Other uses were also mentioned: the list of potential uses was long and included well-drilling muds, bleaches, luminous pigments, dental impression material, light metal alloys, propellants, fertilizers, food preservatives and optical instruments. Increasing demand and the favourable outlook for new and enlarged uses for its products had encouraged the lithium industry to expand. Several new possible United States sources of lithium were seen. Many brines, salines and associated deposits were known to contain lithium. The large pegmatite deposits in Manitoba and Quebec might be developed.²⁷⁴

A number of enthusiastic articles concerning the future of lithium mining in Canada have appeared in the press. Among the uses mentioned has been one "in the hydrogen bomb power area".²⁷⁵ It seems clear that Canada has substantial quantities of lithium and that this mineral could become very important. Any precise judgment at this stage, however, is extremely difficult.

The D.B.S. does not show recent volume data for the production of *magnesium* or *calcium* and shows the value of the production of the two refined metals together. This value rose from \$1.5 million in 1950 to \$6.6 million in 1955. In 1956 the figure was \$5.6 million. According to estimates of the United States Bureau of Mines published by the D.B.S., Canada's production of magnesium in 1954 amounted to 6,600 short tons, as compared with 1,764 tons in 1950. The same source suggested that in 1954 Canada's production was about 5% of the estimated world total, as compared with 50% for the United States, an estimated 32% for the U.S.S.R., and about 4% each for the United Kingdom and Norway. United States 1954 production, however, was 34% below that in 1952.²⁷⁶

The recent study by the United States Bureau of Mines noted that magnesium, the world's lightest structural metal, had achieved a place as a

²⁷³ D.B.S., *The Miscellaneous Non-Metal Mining Industry, 1955; Preliminary Report on Mineral Production, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²⁷⁴ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 467 and 469-70.

²⁷⁵ See, for example, *The Gazette*, Montreal, March 8, May 24, and June 5, 1956; and *The Financial Post*, Toronto, May 5, June 30 and August 25, 1956.

²⁷⁶ D.B.S., *The Miscellaneous Metal Mining Industry, 1955; Preliminary Report on Mineral Production, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

mainstay in worldwide development of air travel and air transportation. During the decade following World War II, magnesium became established as a structural metal for civilian uses. The abundance and wide distribution of the principal magnesium-rich minerals would make the United States self-sufficient in magnesium and its compounds, even without the limitless supply known to exist in the oceans that border the United States. Thus, as was noted earlier, a relatively small part of Canada's \$4.9 million of magnesium exports in 1955 went to the United States. As regards the outlook, the Bureau noted that, in 1953, the magnesium industry forecast that consumption would rise from 44,000 tons in 1952 to 110,000 tons in 1955 and to 125,000 tons in 1960. For calcium, the Bureau stated that the outlook was one of moderate increase in consumption. Its relatively high tensile strength, lightness and ease of fabrication had suggested its use in light structural alloys. Its poor resistance to corrosion and other unfavourable considerations, however, were serious obstacles. Calcium had other potentially large uses, for example, in storage batteries, dehydration of organic liquids, and steel and other metallurgical applications.²⁷⁷

As in aluminum, Canada has the advantage of cheap power in the production of magnesium. Given access to markets, particularly in the United Kingdom, Western Europe and Japan, Canadian production and exports might well increase to several times the present level.

Molybdenum is used largely as an alloying addition in steel and cast iron. World production is dominated by the United States with 90% of the estimated world total of 65.5 million pounds in 1954. Canadian production had a molybdenite, or molybdenum sulphide, content ranging as high as 760,000 pounds in the period 1946 to 1954. In 1955, however, production jumped to 1.4 million pounds and in 1956 was almost 1.5 million pounds. As regards the future, the United States Bureau of Mines stated that the long-term trend for consumption was upward. It noted that the Paley Report estimated that United States consumption would increase to 70 million pounds by 1975 and that consumption in the rest of the free world would be 27 million pounds. Domestic consumption in the United States in 1953 was 31 million pounds. The Bureau also noted the developing use of molybdenite as a lubricant, many new uses for the pure metal which were in a development stage and the growing use of molybdenum in fertilizers. It was suggested that by-product molybdenum might be produced from copper mines under development in Canada and the United States. A relatively small output from molybdenum mines in Canada and Mexico could be expected. After stockpile purchases were terminated, capacity to produce molybdenum would exceed demand, barring a full-scale war emergency. A gradual increase in requirements, however, seemed certain, so that, after a period of several years, present productive capacity might be inadequate.²⁷⁸

²⁷⁷ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 462, 471 and 483.

²⁷⁸ D.B.S., *The Miscellaneous Metal Mining Industry, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*; and U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 549 and 554-555.

The United States Bureau of Mines described the element *selenium* as paradoxical, being either a metal or a non-metal, a conductor or a non-conductor, amorphous or crystalline, colorant or decolorant, and a hydrogenator or dehydrogenator. The most important commercial source of selenium was the anode mud or slime produced in the electrolytic refining of blister copper. It was used in the glass, ceramic, chemical, pigment and rubber industries and, more recently, has been used in the stainless steel industry. Miniature selenium rectifiers for converting alternating to direct current had been used increasingly since 1947. Canadian production of selenium amounted to 427,000 pounds in 1955 and 508,000 pounds in 1956. This was less than production in 1946 but an increase in price had meant that the 1956 value at \$6.9 million was more than seven times that in 1946. Most of Canada's output, produced by International Nickel and Canadian Copper Refineries Limited at Montreal East, is exported. Although the Montreal East plant was larger than any other selenium plant in the world, the United States was the world's leading producer of selenium. The Bureau of Mines has stated that normal industrial demand for selenium was likely to increase more rapidly in the period 1955-57 than production capabilities, in spite of a widespread trend to design away from the use of selenium and the increased use of selenium substitutes. During 1957-59, however, increased selenium production should be possible as a result of several research programmes in progress.²⁷⁹ As has been noted, the value of Canada's exports of selenium and salts more than doubled between 1955 and 1956.

The phenomenal growth of *titanium* dioxide pigments is attributed principally to their high hiding power per unit volume. Metallic titanium owes its importance to the combination of lightness, strength and resistance to corrosion. In addition, titanium white has such other uses as to make paper opaque, to make rubber white, in ceramic glazes, for printing inks, in linoleum, in cosmetics and to delustre artificial silk. The D.B.S. has noted that in 1955 the Quebec Iron and Titanium Corporation mined ilmenite, one of the minerals found in titaniferous ores, and shipped the ore to the smelter at Sorel, Quebec. At the smelter, about 362,500 tons of ore were treated to yield about 116,000 tons of iron (remelt) and steel ingots, and over 162,500 tons of slag. The slag, having a titanium dioxide content of about 71%, was exported for further treatment. Production (and presumably exports) of titanium dioxide in slag rose from 1,596 tons in 1950 to 117,000 tons in 1955 and 152,500 tons in 1956. In addition, small quantities of titanium ore are exported to foreign smelters. According to data from the United States Bureau of Mines published by the D.B.S., world production of ilmenite concentrates in 1954 amounted to about 1.1 million short tons. Of this amount 50% was produced in the United States, 17% in India, 15% in Norway and 11% in Canada. World production of rutile,

²⁷⁹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 777, 778 and 782; and D.B.S., *The Miscellaneous Metal Mining Industry, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

the other commercially important titanium mineral, amounted in 1954 to about 58,000 tons of which 87% came from Australia.²⁸⁰

U.S. trade statistics show 1955 imports of ilmenite at \$5.1 million from Canada and \$1.9 million from India, while imports of rutile were valued at \$2.0 million from Australia. No other sources were listed. The Bureau of Mines noted that in 1953 about 99% of all the ilmenite consumed went into the manufacture of titanium dioxide for pigments. The major use for rutile was for welding-rod coatings. Titanium was estimated to be the ninth most common metal and the fourth most plentiful structural material in the earth's crust. Only ilmenite and rutile, however, had commercial importance. The largest known occurrence of ilmenite in the world was that at Allard Lake, Quebec.²⁸¹

As regards the outlook, the Bureau of Mines stated that any major expansion of titanium production must be premised on the use of ilmenite or high-titania slag. Titanium metal for some time would be used mainly for military purposes where the advantages derived could justify the high price. The requirements for titanium in the future, however, were contingent upon many factors such as development of end uses, availability of alloys with required properties, utilization of scrap and a decrease in price. Estimated future requirements were greater than the production currently contemplated. Such requirements, however, were not firm as they were based in some instances on an assumption of unlimited availability of the necessary quality of metal for applications requiring little or no development in design. Canadian operations were stated to offer the United States a supplemental source of raw material for the industry for many years to come.²⁸²

Considerable enthusiasm has been expressed for the future of titanium and for the future of the mining of titanium in Canada.²⁸³ In the Commission's mineral study, however, it is noted that ilmenite has yet to replace rutile as a satisfactory raw material for metal production. While power is important in the production of titanium slag, the pull of power is less important in the location of the production of titanium metal while the price is at its present relatively high level.²⁸⁴ Canada's production of titanium slag is exported, going largely to a number of large paint manufacturers in the United States. In terms of oxide, Canadian production is equivalent to approximately one-half of all North American requirements. The process of substitution of titanium oxide for zinc oxide, however, is coming to an end. Further, white paints are losing popularity. On the basis of present uses

²⁸⁰ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 905; and D.B.S., *The Miscellaneous Metal Mining Industry, 1955; Preliminary Report on Mineral Production, 1955; and Preliminary Estimate of Canada's Mineral Production, 1956.*

²⁸¹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 907, 908 and 917.

²⁸² *Ibid.*, pp. 905 and 926-927.

²⁸³ See, for example, *The Financial Post*, Toronto, August 18, 1956.

²⁸⁴ The *Paley Report* (Vol. II, p. 77) noted that the production of titanium metal required twice the power needed in the manufacture of aluminum.

of Canada's exports of titanium slag, and with the possibility of a relative decline in price, only a modest increase in the value of exports would be likely between 1955 and 1980. On the other hand, ilmenite is a potential source of titanium metal. Further, as costs are reduced, the pull of relatively cheap power should become more important so that Canada should become a more attractive place for metal production. It is thus possible that there could be substantial exports of titanium metal in 1980. Overseas countries would provide more natural markets for such exports than would the United States. In view of the uncertainties and possible balance of payments limitations, no specific allowance is here made for metal exports, but the possibility provides a part of the basis for the substantial export increase projected in this section and the adjustment in Chapter 4 of Part A.

In 1955 *tungsten* ore and oxide constituted the most important of Canada's miscellaneous non-ferrous metal exports other than brass and products. Canada's tungsten came mainly from mines in British Columbia, although New Brunswick had also appeared as a source. Tungsten is used as an alloying metal in steel (usually as ferro-tungsten). It is used essentially to impart hardness and toughness which are maintained even when the steel is heated to high temperatures. Almost 80% of the consumption of tungsten in the United States was stated to be used for the production of high speed steels for cutting tools, in which the tungsten content was 15% to 20%. In the period 1945 to 1951, Canadian production of tungsten concentrates varied between zero in 1946 and one million pounds (tungsten trioxide content) in 1948. In 1955, production was 1.9 million pounds and, in 1956, 2.2 million pounds. In 1953 Canada produced about 2.2% of the estimated world total as compared with larger amounts in a number of countries, including an estimated 26% in China and 18% in the United States.²⁸⁵

The Paley Report projected that between 1950 and 1975 consumption of tungsten would increase by 150% both in the United States and in the rest of the free world. The Report suggested, however, that tungsten reserves might be insufficient outside of China, which was estimated to have 85% to 90% of the world total. Moreover, production costs in China were so low and the Chinese product was of such superior quality that the possibility of China's re-entry into the world market was a powerful deterrent to large investment elsewhere. Several important properties were being developed in Canada and, although reserves were small and of relatively low grade, it was stated that future Canadian output was expected to contribute substantially to the world total.²⁸⁶

The United States Bureau of Mines has stated that, as production capacity at mines had been stimulated by defence programmes to a point where industrial needs and deliveries to the national stockpile could both be

²⁸⁵ D.B.S., *The Miscellaneous Metal Mining Industry, 1955; Preliminary Report on Mineral Production, 1955*; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

²⁸⁶ *Paley Report*, Vol. II, pp. 26, 29 and 162.

supplied, termination of the stockpile programme apparently would lead to a surplus of productive capacity. However, ore reserves as known would not support this capacity to produce for extended periods without aggressive exploration and development and it seemed probable that in less than 10 and 20 years, respectively, domestic and foreign mines would be depleted to the extent that 1953-54 production rates could not be duplicated. United States consumption, however, would tend gradually to increase; 20 years in the future 12 million to 16 million pounds a year might be used, as compared with widely fluctuating consumption which in 1951 amounted to 11.4 million pounds and in 1953 to 7.7 million pounds. Because of anticipated shortages and high prices, particularly during emergency periods, consumers might design tungsten out of their products.²⁸⁷

In *conclusion*, a variety of observations has been offered in this section on a number of the other non-ferrous metals and their products. Generally, however, these observations are of little direct assistance in leading to a forecast of likely exports in 1980. Further, no comments have been offered on the most important export in the group in 1955, namely, brass and products. Here some increase in exports can presumably be expected to accompany the increase in industrial activity in Canada. In particular, this will probably support a further growth in the important exports of brass scrap, dross and ashes to the United States. For the group as a whole, however, it is not possible to do more than offer a guess as to the likely value of exports in 1980. Recognizing that some of the minerals in this group may increase very rapidly and the group produce at least one major export commodity, but that many uncertainties exist and that in some cases prices may decline, it is here suggested that exports in 1980 will amount to \$225 million or four to five times the value in 1955 and six times the value in 1954. Although some of these commodities, such as magnesium, are exported mainly to overseas countries, it is anticipated that, for the group as a whole, exports to the United States will grow somewhat more rapidly than those to overseas countries.

24. Iron Ore

(a) General Export Position

One of Canada's rapidly expanding exports, iron ore, has grown from a few thousand tons valued at a few thousand dollars in the 1930's to 14.6 million short tons worth \$100 million in 1955. In the first 11 months of 1956, the value at \$142 million was 45% above the same period of the previous year.

Prior to 1949 almost all Canadian exports of iron ore went to the United States. With the entry of Newfoundland into Confederation in that year, the United Kingdom also became a market and subsequently sales to other

²⁸⁷ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 931, 933 and 943.

countries have developed. The United States, however, has continued to be the most important market, taking 66% of the \$40 million value in 1954 and 80% of the \$100 million in 1955 and of the \$126 million in the first ten months of 1956. The volume of exports to the United States rose from 1.1 million tons in 1946 to 11.2 million tons in 1955 and 13.7 million tons in the period January–October 1956.

The volume of exports to the United Kingdom declined somewhat after 1949 but has been over one million tons during each of the years 1953 to 1956, reaching 1.5 million tons or 9% of the total value in 1955.

Exports to the Federal Republic of Germany began in 1950 and increased rapidly to 1.1 million tons or 6% of the total value in 1955. From 1951 to 1953, exports to Japan rose to almost one million tons but fell to little over half this amount in 1954 and 1955. In the latter year they accounted for less than 4% of the value of total iron ore exports. One per cent of 1955 exports also went to the Netherlands and a small amount to Norway.

(b) *Canadian Production*

From 1946 to 1948, Canadian production of iron ore varied between 1.3 and 1.9 million tons. With the entry of Newfoundland into Confederation in 1949, it jumped to 3.7 million tons and, beginning in 1951, increased fairly steadily to 7.4 million tons in 1954. With the first full year of production in the Labrador-Quebec area and a doubling of shipments by Steep Rock, the year 1955 saw Canadian production increase by 112% to 16.3 million tons. In 1956 production again rose, to 22.5 million tons. In 1955 exports were 89% of production.²⁸⁸

(c) *Canada's Place in World Production and Trade*

The United Nations now publishes relatively current data on iron ore production by countries which account for perhaps 95% of the world total.²⁸⁹ Of the 1955 production by these countries, 31.3% was accounted for by the United States, although that country's output had fallen by one-eighth since 1953. Second in importance in 1955 was the U.S.S.R. with 21.1%, followed by France with 14.8%, Sweden with 5.0%, the United Kingdom with 4.8%, Canada with 4.4%, the Federal Republic of Germany with 3.3%, Venezuela with 2.4%, and Luxembourg with 2.1%. By the 12 months ended September 1956, Canada passed both the United Kingdom and Sweden.²⁹⁰

United Nations data show the approximate metal content of ores or concentrates in the countries listed. For Canada, the figure given is 55%.

²⁸⁸ D.B.S., *The Miscellaneous Metal Mining Industry, 1955; Preliminary Estimate of Canada's Mineral Production, 1956*; and *Trade of Canada*.

²⁸⁹ United Nations, *Monthly Bulletin of Statistics*, January 1957, gives data for 32 countries and territories. In 1953 these same areas accounted for 94.7% of the U.S. Bureau of Mines' estimated world total production (D.B.S., *The Miscellaneous Metal Mining Industry, 1955*).

²⁹⁰ United Nations, *op. cit.*

This compares with 65% for Venezuela, 60% for the U.S.S.R. and Sweden, 50% for the United States, 35% for France, and 30% for the United Kingdom, Western Germany and Luxembourg.²⁹¹

It has been estimated that in 1953 world production of pig iron and ferro-alloys totalled 180 million short tons, while the production of steel ingots and steel for castings amounted to 258 million short tons. Much the largest producer was the United States which accounted for 43% of both pig iron and steel production. This compared with 36% of the iron ore production, suggesting an iron ore deficit in the United States. Second came the U.S.S.R., with 16% of pig iron and steel production, probably a bit less than the percentage for iron ore. The United Kingdom produced 7% of the world's pig iron and 8% of its steel, as compared with 5% of its iron ore. Western Germany accounted for 7% of the pig iron and steel and only 4% of the iron ore, while France produced 5% of the pig iron, 4% of the steel and 13% of the iron ore. Japan was shown as having 3% of the pig iron and steel production and only 0.5% of the iron ore.²⁹²

United States trade data show imports of 2.4 million long tons of iron ore in 1937, and only 2.7 million tons in 1946. By 1955, these imports had reached 23 million tons valued at \$177 million. In 1955 Canada supplied 43% of total imports, as compared with 16% as recently as 1953. Following Canada in importance in 1955 were Venezuela with 30%, Peru with 7%, Sweden with 5%, and Chile, Brazil and Liberia with about 4% each.

United Kingdom imports of iron ore and concentrates increased to almost 13 million tons in 1955 when Canada supplied 11% of the total volume. Other important suppliers were Sweden with 32% of the total, Algeria with 16%, Tunisia with 7%, Spain with 6%, and Sierra Leone and France with 5% each.

Canada's third most important market for iron ore, the Federal Republic of Germany, is another heavy importer. United Nations data show that total imports fell slightly from 1952 to 9.4 million metric tons in 1954, but then rose to 15.1 million tons in 1955. Canada's share of the total volume rose from 2.6% in 1952 to 7.3% in 1955 and her position improved from ninth to third place among foreign suppliers of iron ore to Germany. Still much the most important supplier in 1955 was Sweden with 43% of the total volume, followed by Spain with 7.8%.²⁹³

United Nations data do not show a country distribution for Japanese imports of iron ore prior to 1954 and 1955 when Canada supplied 11% and

²⁹¹ *Ibid.*

²⁹² Data on pig iron and steel production were compiled by American Iron and Steel Institute and published by American Metal Market in *Metal Statistics, 1955*, pp. 256-257. The figures given for France (and Western Germany) exclude 1.5% of the world's pig iron and 1.1% of its steel produced in the Saar. Data on iron ore are as published by the U.S. Bureau of Mines and reproduced in D.B.S., *Miscellaneous Metal Mining Industry, 1955*.

²⁹³ United Nations, *Commodity Trade Statistics*, January-December 1952, January-December 1953, January-December 1954, and January-December 1955.

9%, respectively, of total imports of over five million metric tons, less than the amounts from the Philippine Republic, Malaya and Singapore, or India.²⁹⁴ It would appear from Canadian data and the totals published by the United Nations that Canada's share of the Japanese market had decreased substantially.

(d) Market Outlook

The Paley Report forecast a 54% increase in United States consumption of iron ore between 1950 and 1975, and a 73% increase in the rest of the free world. For the United States, the projected rate of growth was much less than the more than doubling which took place in the period 1925 to 1950. The magnitudes, however, were very large — steel production in 1950 was about 100 times that of the second largest metal, copper, and about 20 times that of all other metals combined.²⁹⁵ Associated with the forecasted consumption of iron ore in the United States was a rise in steel ingot capacity from 100 million tons in 1950 to 160 million tons in 1975 and an increase in blast furnace capacity from 71.5 million tons to 100 million tons. In addition, the consumption of scrap was expected to rise from 68.8 million tons to 107 million tons.²⁹⁶

Despite the use of lower grade domestic ores, it was not anticipated that United States production would keep pace with domestic demand for iron ore. As is indicated in the following table, it was expected that United States imports of iron ore would rise from 15% of consumption in 1950 to 35% in 1975. To meet United States demands and the anticipated consumption elsewhere, the rest of the free world would have to double its production of iron ore.

Projected Increase in Requirements of Iron Ore (50%)

(millions of short tons)

	1950	1975	% increase
U.S. consumption.....	130	200	54
U.S. production.....	110	130	18
U.S. imports.....	20	70	250
Other free world consumption.....	105	180	71
Total = required o.f.w. production.....	125	250	100

SOURCE: Consumption data from *Paley Report*, Vol. II, pp. 118 and 132, rounded in one case. U.S. production data rounded from chart appearing in Vol. I, p. 58, and Vol. II, p. 6. These charts show rather smaller other free world consumption and production than the figures given here but the end result is a required doubling of other free world production.

²⁹⁴ *Ibid.*

²⁹⁵ *Paley Report*, Vol. I, p. 9; Vol. II, pp. 4, 118 and 132; and Vol. IV, p. 6.

²⁹⁶ *Ibid.*, Vol. II, pp. 12–13. On p. 7 of Vol. IV, however, it was stated that improved processes might reduce the availability of "home scrap" and force the industry to turn to "synthetic scrap" produced from new pig iron.

Estimates of world resources of iron ore presented in the Report showed Canada with substantial high-grade reserves (50% iron and over) but larger reserves in Brazil and India. Large reserves of intermediate quality were shown for Cuba, France, South Africa and the U.S.S.R., and very large low-grade reserves for Southern Rhodesia and the United States.²⁹⁷ For the future, the Report suggested the possibility that shipments from Canada and Venezuela could approach 65 million tons annually (apparently short tons). Elsewhere in the Report, however, imports from Labrador-Quebec and Venezuela were each put at 40 million long tons annually in the period 1965-75.²⁹⁸

The recent study by the United States Bureau of Mines stated that the magnitude, availability and potential flexibility of the Labrador-Quebec deposits made them very important. In addition to one billion long tons of high-grade ore shown for this region in the Bureau's resource listing, at least a billion tons of 40% iron material, amenable to gravity concentration, was indicated by reconnaissance mapping close to the railway. Ultimate reserves at Steep Rock might exceed the 70 million tons shown for Ontario, but great depth and mining difficulties would restrict annual production. The high phosphorus content of the Newfoundland deposits (3.5 billion tons) made them more attractive to Europe than to the United States. In contrast to the Canadian reserves shown at 4.6 billion tons (over 50% Fe), 1.0 billion tons (35%-50% Fe) and 0.1 billion tons (25%-35% Fe), those for the United States were 4.2 billion tons, 2.2 billion tons and 61.0 billion tons, respectively. Of the low-grade reserves, however, 60 billion tons were taconites, and of these only five billion were the relatively more easily handled magnetic taconites. All of the taconites, however, were classed under the heading "concentration techniques not perfected". The study noted that, despite their vast extent, taconite production could not be expanded quickly.²⁹⁹

The Bureau of Mines showed Brazilian reserves as far less than the amount given in the Paley Report and noted the inadequacy of information as well as the problems of inaccessibility and the silica content of some ores. Cuban reserves were also shown far below the figure in the Paley Report but the study noted that the lateritic ores might reach three or four times the three billion tons shown. The recovery of this iron, as well as that in similar deposits elsewhere, awaited a successful method of beneficiation.³⁰⁰

Like the Paley Report, the Bureau of Mines anticipated that steel capacity in the United States would grow from 100 million short tons in 1950 (and 126 million tons in 1955) to 160 million tons in 1975. The Bureau suggested,

²⁹⁷ *Ibid.*, Vol. II, p. 148.

²⁹⁸ *Ibid.*, Vol. II, p. 15; and Vol. IV, p. 41.

²⁹⁹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 377, 379-380, and 382.

³⁰⁰ *Ibid.*, pp. 380 and 382.

however, that this estimate might be too conservative. Iron ore requirements, allowing for a small export, would grow from 109 million long tons in 1950 (and 144 million tons in 1955) to 183 million tons in 1975, assuming that adequate scrap would be available. The estimates of domestic production indicated that increasing imports of iron ore would about equal the increase in requirements, assuming that United States ores could compete with imports. Thus, of the 183 million long tons of ore required in 1975, 115 million tons were seen as potentially available from United States sources, 38 million tons from Canada (including 30 million from Labrador-Quebec), 20 million tons from Venezuela and 10 million tons from other sources.³⁰¹

Another forecast of potential sources of iron ore was prepared by Verne D. Johnston, consultant to Oglebay, Norton and Co., of Cleveland, and appeared in the December 1955 issue of *Engineering and Mining Journal*. This forecast was based on an estimate by Benjamin F. Fairless, Chairman of the Board of United States Steel Corporation, that United States pig iron capacity in 1974 would approximate 98 million short tons and that steel ingot capacity would be about 155 million short tons. The resulting forecast differed somewhat from that of the United States Bureau of Mines. Nevertheless, it also showed a great drop in the ore available from traditional sources and a vast increase in that coming from newer sources, *i.e.*, taconites and imports. According to this forecast, some 45% of 1984 consumption would be provided for by imports. Imports from Canada, however, were smaller than those suggested by the Bureau of Mines — 25.3 million tons in 1975, 27.5 million in 1980, and 30.3 million in 1984.

The article in *Engineering and Mining Journal* pointed out that the forecast used was considered low by some representatives of the steel industry. Thus, the president of Republic Steel had suggested 170 million tons of steel capacity in 1975; the president of Bethlehem Steel saw 185 million tons by 1970; the president of Inland Steel offered 216 million tons by 1980 and a vice-president of Cleveland-Cliffs Iron Company forecast 177 million tons in 1980.

In considering Canada's future exports of iron ore, forecasts of world demand are of limited use since it must be assumed that Canada's share of the world market is increasing. Three forecasts of Canadian exports to the United States have been examined in the foregoing paragraphs. The Paley Report suggested that Labrador-Quebec shipments to the United States might rise to as much as 40 million long tons annually in the period 1965 to 1975. The United States Bureau of Mines forecast 38 million long tons of Canadian exports to the United States in 1970 and in 1975, with 30 million tons from Labrador-Quebec. Verne D. Johnston suggested that total Canadian exports to the United States would amount to 25.3 million long tons in 1975 and to 27.5 million tons in 1980. As regards exports to

³⁰¹ *Ibid.*, pp. 372, and 393-394.

countries other than the United States, it is to be assumed that Canada will share in the increased consumption, which was projected by the Paley Report at 73% between 1950 and 1975. It must, however, be remembered that iron ore is not a scarce resource in comparison with many other minerals. The basic strength of the Canadian exports position depends upon the location of Canadian deposits geographically and strategically close to the United States and on the participation of United States consumers in the Canadian development.

Various briefs presented to the Commission considered the availability of supplies of iron ore in Canada. According to the Submission of the Government of Newfoundland, production of Dominion Wabana Ore Ltd., a subsidiary of Dominion Steel and Coal Corporation located on Bell Island, was 2.5 million tons of iron ore in 1954 and was expected to be close to the capacity of 2.8 million tons in 1955. Estimates of reserves ranged from one billion to as high as 10 billion tons and it might be inferred that output could be greatly increased.³⁰² It is reported that it had been arranged that, over the seven years beginning March 31, 1955, 12 million tons of ore would be sold to the United Kingdom and Western Germany.

The Iron Ore Company of Canada in the Labrador-Quebec area is owned by a group of American steel companies in association with Hollinger Consolidated Gold Mines, the M. A. Hanna Company and the concession companies — Hollinger North Shore Exploration Company and Labrador Mining and Exploration Company. The Newfoundland Brief stated that, while proven reserves in the area had been stated at just over 400 million tons, it was safe to say that reserves would develop at the rate at which the company wished. The Brief anticipated that, with the opening of the improved St. Lawrence Seaway, production from the area would be increased to 20 million tons, with 50 million tons already foreseen.³⁰³ The Iron Ore Company would appear to be less optimistic, at least for publication; in September 1956, the general manager is reported to have said that eventually it was hoped that 20 million tons a year would flow from the company's deposits.³⁰⁴

The Newfoundland Submission also referred to the prospective exploitation by Canadian Javelin Ltd. of more than one billion tons of rich ore in the Lake Wabush area in Labrador. Plans called for annual shipments beginning in 1957 of two million to three million tons of ore which would be beneficiated to bring the grade to 63% iron.³⁰⁵ Subsequently, it was

³⁰² *Submission by the Government of the Province of Newfoundland to the Royal Commission on Canada's Economic Prospects*, October 1955, pp. 45-46.

³⁰³ Government of the Province of Newfoundland, *op. cit.*, p. 47.

³⁰⁴ *The Gazette*, Montreal, September 7, 1956. See also Hollinger-Hanna Limited, *Submission to Royal Commission on Canada's Economic Prospects* on behalf of Iron Ore Company of Canada, Hollinger North Shore Exploration Company Limited, and Labrador Mining and Exploration Company Limited, Montreal, February 22, 1956.

³⁰⁵ Government of the Province of Newfoundland, *op. cit.*, p. 48.

announced that this company had concluded contracts for the annual delivery of two million tons of pelletized iron ore and concentrates to Germany and one million to the United Kingdom, and that the Steel Company of Canada and Pickands Mather and Co. of Cleveland would purchase up to two million tons a year over the period 1959 to 1964 and, in addition, would lease an ore body to yield at least 200 million tons of concentrates from Canadian Javelin.³⁰⁶ Later, formation of a subsidiary to develop deposits 20 miles north of those at Lake Wabush was announced.³⁰⁷

The Province of Ontario Brief reviewed the various sources within the province and suggested that by about 1960 Ontario would be shipping over 14 million tons of iron ore annually. The Steep Rock range, including the ore body leased to Inland Steel, was expected to produce ten million tons a year and ore reserves were sufficient to ensure production at that rate for some decades. For the Marmoraton mine, owned by the Bethlehem Steel Corporation, annual production of well over one million tons was anticipated. International Nickel planned to extract as much as one million tons of high-grade iron oxide annually. In addition to these sources and the Algoma District, there existed other medium to low grade deposits. ". . . Almost certainly within 25 years from the present, some of the extensive low grade deposits will have been developed and these may add materially to Ontario's production".³⁰⁸

The Mining Association of British Columbia told the Commission that operations of the two chief producers of iron ore in that province had been limited by marketing problems, production having been sold in Germany and Japan.³⁰⁹ British Columbia's output dropped from 991,000 short tons in 1953 to 536,000 tons in 1954 and in 1955 amounted to 698,000 tons.³¹⁰ In the spring of 1956, the press carried reports of contracts for the sale of British Columbia iron ore to Japan amounting to 700,000 and 1,380,000 tons, delivery of the latter to be spread over three years.³¹¹

In recent months the press has carried many optimistic reports of vast new iron developments, largely in Quebec and including those relating to Rio Tinto's Oceanic Iron Ore of Canada in the Ungava Bay region, the Iron Sands deposits of Aconic Mining Corporation with reported contracts for German, United Kingdom and United States sales, Cyrus Eaton's "initial plans" to ship ten million tons a year from northern Ungava, the

³⁰⁶ *The Gazette*, Montreal, April 9, May 15 and October 16, 1956; and *The Financial Post*, Toronto, April 21 and October 20, 1956.

³⁰⁷ *The Financial Post*, Toronto, December 8, 1956.

³⁰⁸ *Submission of Ontario to the Royal Commission on Canada's Economic Prospects*, January 26, 1956, pp. 28, 152 and 154. See also Northwestern Ontario Associated Chambers of Commerce, Northwestern Ontario Municipal Association, and Northwestern Ontario Development Association, *Northwestern Ontario Brief Presented to the Royal Commission on Canada's Economic Prospects*, 1956; and *Brief to Royal Commission on Canada's Economic Prospects* by Ontario Mining Association, January 1956, p. 16.

³⁰⁹ *Submission of the Mining Association of British Columbia to the Royal Commission on Canada's Economic Prospects*, December 31, 1955, p. 13.

³¹⁰ D.B.S., *Preliminary Report on Mineral Production, 1954, and 1955*.

³¹¹ *The Financial Post*, Toronto, April 14, 1956; and *The Gazette*, Montreal, June 20, 1956.

Jones and Laughlin arrangements for the exploration of the properties of Quebec Cobalt and Exploration Limited, U.S. Steel's Quebec Cartier Mining Co. with a reported target of five million tons of pellets and the possibility of extension 100 miles northeast to another deposit, and the activities of Steel of Canada and associated United States interests at Bristol, Quebec, and in Ontario.

The assessment of these prospects, particularly such as were referred to in the preceding paragraph, is very difficult. It would appear, however, that production from established or relatively certain sources might exceed 80 million short tons in 1980, and that markets might be available for this much iron ore.

On the other hand, certain experts have been less optimistic. In his brief to the Commission, the vice-president of Noranda suggested that maximum iron ore consumption in Canada in 1980 would be in the order of 17.5 million tons and that there was every reason to believe that the annual Canadian production at that date would be twice that amount.³¹² The Northwestern Ontario Brief quoted the president of Steep Rock as saying that reserves, conservatively estimated, would support for generations the 30 million to 40 million ton annual output which he suggested as reasonable for the industry. In February 1956, the Director of Metallurgy of the Ontario Research Foundation was reported as predicting that by 1980 production would be at the level of about 45 million tons a year.³¹³

An enthusiastic article in *The Financial Post* in March 1956 stressed the widespread occurrence of iron ore in Canada, but the highest over-all output figure which it cited was 50 million tons. In addition to "at least five or six billion tons of high grade shipping ore", the article referred to the emergence of billions of tons of concentrating ore in Canada, fitting in with United States emphasis on tailored ores from low-grade sources. Reference was made to predictions that iron ore output could reach 35 million or 40 million tons in 1960, largely as a result of expanded production in the Labrador-Quebec and Steep Rock ranges. Now the picture looked more like 40 million to 45 million tons by 1960 and perhaps 50 million tons about 1962 or 1963. Canadian iron ore authorities were said to think that the 38 million ton figure would probably be reached a lot earlier than the Bureau of Mines has forecast. With the steel expansion programme in progress, growing competition to secure and develop iron ore resources was hardly surprising. The extremely hard United States taconite ores, and the prices needed to turn out an economic product, had focused attention on resources of concentrating grade in Canada, as much of these ores looked better than the taconites.³¹⁴

³¹² H. L. Roscoe, *op. cit.*

³¹³ *The Gazette*, Montreal, February 11, 1956.

³¹⁴ *The Financial Post*, Toronto, March 3, 1956, pp. 41 and 72. An article in the November 3, 1956, issue of the *Post* suggested production by 1967-70 close to 55 million tons annually.

The executive vice-president of Hollinger-Hanna Limited has suggested that shipments may well exceed 40 million long tons by the mid-1960's. He also noted that, because of high costs in new blast furnace construction, the present trend was to use ores containing the highest possible iron content. By using a 60% to 65% iron content, particularly in pelletized or agglomerated form, production from existing blast furnaces could be increased by as much as 20%.³¹⁵

Considering all of the various prospects, it may be suggested that production in 1980 will be at least 80 million short tons, with about 70 million tons exported. Of this amount, it seems reasonable to expect that sales to the United States might be about 55 million short tons (49 million long tons) and that the balance would go to the United Kingdom, Western Europe and Japan. The average value of exports was \$6.85 per ton in 1955 and \$7.11 in the period January–October 1956. At the latter figure, exports in 1980 would be valued at about \$500 million.³¹⁶

25. *Primary Iron and Steel (Including Scrap)*

Canada's domestic exports of ferro-alloys, pigs, ingots, blooms, billets, castings, forgings, rolling mill products and scrap iron and steel aggregated about \$10 million in each of the years 1937 to 1939. After the war, they grew to about \$85 million in 1952 and in 1953. They declined to \$43 million in 1954 but more than doubled in value in 1955, to reach \$92 million.³¹⁷ While these exports are exceeded by imports — amounting to \$164 million in 1955 — they constitute an important, although fluctuating, element in Canada's export picture. The breakdown for the years 1937, 1954 and 1955 is indicated in the following table.

Canada's Domestic Exports of Primary Iron and Steel (Including Scrap)

(thousands of Canadian dollars)

	1937	1954	1955
Ferro-chrome	954	2,741	2,215
Ferro-manganese	n.a.	555	5,207
Ferro-silicon	n.a.	3,270	5,650
Ferro-alloys, n.o.p.	1,082	82	93
Pig iron	852	10,022	13,273
Billets, ingots and blooms	2,296	1,191	20,422
Castings of iron or steel, rough	218	2,988	2,814
Forgings of iron or steel, rough	3	843	1,178

³¹⁵ *The Financial Post*, Toronto, October 20, 1956.

³¹⁶ In the trade data, Canada's exports of iron ore are valued at the point of lading. For Steep Rock, the point of lading is at the mine. For the Iron Ore Company of Canada, it is at Seven Islands, after which, however, considerable 'inland freight' may still accrue to Canadian carriers. An increase in Canada's iron ore exports would accordingly mean an increase in freight earnings which would show up in that segment of the Canadian balance of payments.

³¹⁷ When the first eleven months of 1956 are compared with the same period in 1955, a decline in the exports of pigs, ingots, blooms and billets (as a group) was more than offset by increases in the other items, so that total exports rose from \$82 million in 1955 to \$92 million in 1956.

*Canada's Domestic Exports of Primary Iron and Steel
(Including Scrap) — (Continued)*

	1937	1954	1955
Bars of iron or steel	467	2,160	4,103
Rods of iron or steel	952	61	731
Plates, sheets and strips	21	2,950	8,740
Railway rails	1,064	60	6,172
Structural steel	318	163	567
Scrap iron or steel	1,955	15,868	20,936
Total	10,182	42,954	92,101

In 1937 the United States was Canada's most important export market for ferro-alloys and scrap. The United Kingdom, however, dominated the market in the items from pig iron to rolling mill products and accounted for 44% of export sales for the group as a whole, as compared with 27% of the total to the United States. In recent years, the position of the United States has been much more important, that market accounting for 60% of export sales in 1954 and 53% in 1955, when the United Kingdom took 17% and 20%, respectively.

In 1955, 69% of Canada's exports of ferro-alloys went to the United States and 26% to the United Kingdom, largely in the form of ferro-silicon for which the United Kingdom provided the largest market. Although a relatively unimportant purchaser in the years immediately before the war, the United States has accounted for over half of the sales of pigs, ingots, blooms, billets, castings, forgings and rolling mill products in each of the years beginning with 1950. While United States purchases of these items doubled between 1954 and 1955, the percentage taken fell from 81% to 57%. This was accompanied by an increase in exports to the United Kingdom from insignificance to almost \$10 million or 17% of the total. In addition, Mexico purchased almost \$6 million of railway rails, the Netherlands bought over \$2 million of billets, ingots and blooms, and sales to Australia of rolling mill products aggregated over \$1 million. Most sales of scrap iron and steel in the immediate prewar period went to the United States and Japan, while in the years 1946 to 1951 exports of \$2 million or less went almost entirely to the United States. Since then, European sales have become important and the total value has increased very greatly. Of the \$21 million of exports in 1955, 29% went to the United States, 28% to the United Kingdom, 19% to Italy and 17% to the Federal Republic of Germany.

While there was a significant increase in Canadian iron and steel production between 1954 and 1955, the relative increase in the volume of exports of primary iron and steel was much greater. The difficulties created by the fluctuating nature of the market for primary iron and steel is noted

in the Commission's study on the industry. There it is stated that in 1954, when the impact of reduced economic activity was aggravated by the fact that consumers of steel tended to live off their inventories, several not very lucrative export orders were accepted by the Canadian industry. These proved embarrassing to fill in the stringent supply conditions of subsequent months.³¹⁸ The export of steel rails to Mexico may fall into this category of sales.

The Commission's study indicates the difficulty of projecting the level of Canadian steel production in 1980. But both that study, and the one on secondary manufacturing industry, suggest a rise in steel production to several times its present value. The basic raw materials, iron ore and coal, are available to the Canadian industry as cheaply as to that in the United States. Man-hour productivity is probably nearly as good at the blast furnace and open hearth stages in Canada as in the United States industry, but lower in Canada at the rolling mill level, and probably by a fair margin. To some extent, this is offset by the lower level of wages in Canada, although the differential has narrowed since the war. Nevertheless, such information as is available indicates that the spread between United States and Canadian mill prices has narrowed considerably over the past two decades. As regards location, Algoma Steel Corporation, at Sault Ste. Marie, is in a good position to export pig iron to foundries in the United States and more than half its merchant pig is sold in that country. Dominion Steel and Coal Corporation Limited, at Sydney, Nova Scotia, has the advantage of water transportation to export markets. In the early postwar years Dosco's exports were as high as 50% of production. They fell to less than 5%, but in 1955, largely because of the sale of steel rails to Mexico, they accounted for roughly 20%. With respect to overseas competition, the industry study notes that, in contrast to the comparatively stable price policies followed by the steel industry on this continent, Western European and Japanese exporters have tended to reduce prices drastically during competitive periods and to charge high premiums in times of scarcity. There appears, however, to be some hope that the functioning of the European Coal and Steel Community may have a stabilizing effect on European export prices. Growing domestic markets might tend to have a similar effect. Finally, there is suggested an increased tendency of the Canadian industry to pioneer, as in the introduction by Dominion Foundries and Steel Limited of the Austrian oxygen steelmaking process to this continent.³¹⁹

Despite the expectation of continued imports, Canada is capable of exporting primary iron and steel at an increasing rate. Future growth of an efficient industry will be aided by the increased production of iron ore in

³¹⁸ The Bank of Nova Scotia, *The Canadian Primary Iron and Steel Industry*, Chap. 11.

³¹⁹ *Ibid.*, Chaps. 6, 7, 8, 10, 11, and 12; and D. H. Fullerton and H. A. Hampson, *Canadian Secondary Manufacturing Industry*, Chap. 11.

Canada and by the availability of electricity which is required in the production of ferro-alloys and used increasingly in steel production.³²⁰

Some of the varied expectations regarding future steel production in the United States have been given in the foregoing section. Assuming world prosperity, very substantial increases can be expected in the use of steel in both developed and underdeveloped countries. The iron and steel industry, however, is traditionally heavily protected and it is to be expected that this protection will continue, not only in those countries which already have large steel industries but also in those countries which are seeking to promote industrial development. The development itself, however, requires the use of iron and steel. While periodic difficulties will undoubtedly exist, Canada should be able to export significant quantities of primary iron and steel 25 years hence. As in recent years, these exports may show considerable year-to-year volatility with, however, the probability of the existence of a fairly firm market for scrap to feed the steel furnaces of the world. Despite the volatility, however, the level of exports should, on the average, be substantially above that recently experienced, although growing less rapidly than Canadian steel capacity. Accordingly, it is suggested that exports of primary iron and steel, including scrap, will increase from \$92 million in 1955 to about \$200 million in 1980.

26. Fertilizers

(a) General Export Position

Analysis of Canada's domestic exports of fertilizers is made somewhat difficult by the changes in classification which have occurred over the years and by the fact that for 1955 no volume data have been published for the major items. The data show, however, that there has been a large increase in both the volume and value of fertilizer exports since before the war. In 1937 and in 1938, 273,000 tons and 282,000 tons, respectively, were exported. In 1939 the figure rose to 364,000 tons, but by 1950 this amount had been more than doubled. In 1953 and again in 1954 exports amounted to about 710,000 tons. Meanwhile, the total value of exports rose from about \$7 million in 1937 and in 1938 and \$9 million in 1939 to \$39 million in 1949 and 1950. In 1952-54 the value was up to \$42 million and in 1955 it rose further, to \$56 million.³²¹

In 1955, almost 20% of Canada's fertilizer exports by value was in the form of ammonium sulphate, 45% consisted of other nitrogen fertilizer, 31% phosphate fertilizer, and 4% mixed fertilizer. Since 1939 the most striking increase has been in phosphate fertilizer, the value of which has increased tenfold. But significant volume as well as value increases have also occurred in ammonium sulphate and other nitrogen fertilizer.

³²⁰ The U.S. Bureau of Mines noted that some have predicted that electric furnace production of carbon steel might increase from 3.7% of the U.S. total in 1953 to 30% by 1975 (U.S. Department of the Interior, Bureau of Mines, *op. cit.*, p. 803).

³²¹ In the first eleven months of 1956, fertilizer exports were valued at \$45 million as compared with \$51 million in the same period of 1955.

The United States is much the most important of Canada's export fertilizer markets, taking 86% of the total export value in 1929, 76% in 1937, 74% in 1950, 94% in 1953 and 79% in 1955. Although it has tended to decrease in recent years, the most consistently important market outside the (continental) United States has been Hawaii which took 11% of the total in 1949. In 1955, however, the figure was down to 2%. After the war, significant values were taken by the United Kingdom, India, South Africa, France, the Netherlands, Japan, the Philippine Republic, Egypt and China. But, except for the continuance of some sales to the Philippines, and the reappearance of China in 1955, these markets entirely or virtually disappeared. In 1955 Korea accounted for 9% of Canada's total exports of fertilizer, Greece for over 2%, and China, Mexico, Colombia and the Philippine Republic for somewhat under 2% each.

(b) *Canadian Production*

In the year ended June 30, 1955, production of fertilizer materials in Canada amounted to 1,199,000 tons and the output of mixed fertilizers to 720,000 tons. The figures, however, are not additive, as some of the fertilizer materials were used in making the mixtures. In the same period, sales of mixed fertilizers and fertilizer materials for direct application to the soil, including export, amounted to 1,609,000 tons. Of this amount, 51% (818,000 tons) was exported and 49% sold to Canadian users. Of the 1.6 million tons total sales, 921,000 tons consisted of fertilizer materials, of which exports took 85%. The remaining 687,000 tons consisted of mixed fertilizers, of which only 5% was exported. Imports in the year ended June 30, 1955, amounted to 935,000 tons, the more important items being natural phosphate rock (507,000 tons), superphosphate, muriate of potash, nitrogen solution and sulphate potash. The phosphate rock was used in Canadian plants to make superphosphate and ammonium phosphate, and most of the other imported materials were used in making mixed fertilizers.³²² Although Canada exports phosphate fertilizer, this is based on domestic treatment of imported phosphate rock. Further, little or no potash has so far been mined in Canada.

(c) *Canada's Place in World Production and Trade*

Despite the scale of her exports, Canada is a relatively small producer of fertilizers. Data published by the United Nations do not list Canada among the producers of phosphate rock or potash salts. Over half of the former produced outside the U.S.S.R. came from the United States, while the bulk of the non-U.S.S.R. supplies of potash salts were mined in the United States (and its dependencies), Germany and France. Canadian production of superphosphates in the year ended June 30, 1954, is given as 198,000 metric tons, as compared with 11 million tons in the United

³²² D.B.S., *The Fertilizer Trade, July 1, 1954-June 30, 1955*.

States in calendar 1954. As has been noted, Canada's largest fertilizer exports are nitrogenous fertilizers (ammonium sulphate and nitrogen fertilizer, n.o.p.). In terms of nitrogen content, Canadian production is stated in the data published by the United Nations to have been 178,000 metric tons in the year ended June 30, 1955, or only 3% of the world total excluding the U.S.S.R. The United States and dependencies produced 28%, the Federal Republic of Germany 12% and Japan 10%.³²³

The United States is much the largest fertilizer consumer. According to U.N. data, in 1954-55, the United States and its dependencies consumed 33% of the phosphatic fertilizers used outside the U.S.S.R., 35% of the nitrogenous fertilizers, and 32% of the potash fertilizers.³²⁴

United States consumption of fertilizer is substantially above its international trade. In 11 states, from Virginia through the south to Texas and Oklahoma, consumption rose from 5.1 million tons in 1929 and 5.0 million tons in 1937 to 9.5 million tons in 1952. In 1955 the figure was 9.1 million tons. From 1929 to 1933, United States imports exceeded exports by volume. Subsequently, however, exports have generally been greater than imports. In 1955, exports at 4.1 million tons were at their peak, while imports at 2.5 million tons were below the 2.9 million ton level of 1953. Tonnage figures, however, hide the fact that the United States imports a much more valuable product than it exports. Thus, according to 1955 data published by the United Nations, exports were valued at US\$ 91 million while imports were \$110 million.³²⁵

United Nations data suggest that Canada, although a relatively unimportant exporter of crude fertilizers, was the fourth largest exporter of manufactured fertilizers in 1954. Among the countries for which data are shown, the list is as follows: exports of US\$ 114 million by Western Germany, \$92 million by Belgium-Luxembourg, \$69 million by the United States, \$57 million by Canada, \$42 million by France and by Japan, and \$41 million by the Netherlands.³²⁶

Much the largest import market for manufactured fertilizers shown by the United Nations data is the United States, with imports of \$82 million in 1955. Next in importance were the United Kingdom and Denmark with about \$27 million each. Canada holds a considerably more important position in the United States import market than in total world trade. In 1955, Canada supplied 61% of United States imports of manufactured fertilizers. Other important suppliers were Western Germany with 15% and the Netherlands with 6%.³²⁷

³²³ United Nations, *Statistical Yearbook, 1955*.

³²⁴ *Ibid.*

³²⁵ U.S. Department of Commerce, *Business Statistics 1955, Supplement to the Survey of Current Business; and Survey of Current Business*; and United Nations, *Commodity Trade Statistics, January-December 1955*.

³²⁶ United Nations, *op. cit.*

³²⁷ *Ibid.*

(d) Market Outlook

In the Paley Report consideration of fertilizer, it was stated that, judging by the amount of food and clothing required to support the 1950 United States population of 150 million, it would take about 40% more farm production to support 190 million Americans in 1975 at a high standard of living. Under the best conditions, in order to produce enough to meet the national need, farmers would need by 1975 more than two and one-half times the four million tons of primary plant nutrients (nitrogen, phosphate and potash) contained in the 18.5 million tons of commercial fertilizers which they used in the crop year 1950. A large portion of this increase in fertilizer use would go solely to maintain 1950 levels of agricultural yield.³²⁸

When the Paley Report was written, the United States had become largely self-sufficient in the supply of nitrogen, phosphate and potash. But although United States resources of fertilizer materials were large, they were not felt to be large enough to permit complacency. The future demands on these raw materials were seen to be so great that the United States would have to seek better methods of using known resources and probe for additional sources. In addition, expansion of manufacturing and processing facilities was regarded as vital. Even though extensive facilities existed, capacity had generally not fully kept pace with demand. In the case of phosphates, more than 90% of those used as fertilizer were produced by processes involving treatment of phosphate rock with sulphuric acid. While plentiful supplies of sulphur had been available, a serious shortage had developed and would have to be overcome to support increased phosphate fertilizer production. The development of methods independent of the use of sulphuric acid was urged.

The recent study by the United States Bureau of Mines contained separate chapters on nitrogen compounds, phosphate rock and potash.³²⁹ The chapter on nitrogen compounds noted that, in addition to fertilizers, these had important uses in explosives and that increasing quantities were being used in plastics and synthetic fibres. Between 1951 and 1954, the nitrogen industry in the United States was expanded rapidly and additional facilities were under construction in 1954. In addition to synthetic production from the atmosphere, significant amounts of nitrogen compounds were obtained from by-product coke ovens. On the outlook for nitrogen compounds, the Bureau pointed out that some industry sources predicted that there would be excess capacity for the next few years. Agricultural and

³²⁸ The consideration of "United States Fertilizer Resources" was contained in Report 8 of Vol. V of the *Paley Report*, a condensation of a paper prepared by the U.S. Department of Agriculture, the Tennessee Valley Authority, and the Department of the Interior. Reference to the same increase in agricultural production and fertilizer use was made in Report 7, of Vol. V, a paper entitled "Future Demands on Land Productivity" prepared by John D. Black and Arthur Maass of Harvard University.

The population estimate of 190 million in 1975 is considerably below subsequent forecasts by the U.S. Bureau of the Census. In *Current Population Reports*, Series P-25, No. 123, "Population Estimates", October 20, 1955, the United States population in 1975 was expected to be between 207 million and 228 million.

³²⁹ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 569-576, 681-693, and 703-713.

industrial demand, however, probably would continue to increase and the long-range outlook was for continued growth of the nitrogen industry. One problem of the industry was to determine the level of production facilities needed to achieve maximum wartime production and at the same time enable the industry to operate profitably during periods of minimum market demand.

In its chapter on phosphate rock, the Bureau of Mines noted that the United States, North Africa, the U.S.S.R. and the islands of the Pacific and Indian Oceans supplied most of the world's production. The United States was more than self-sufficient and productive capacity was believed to be adequate to meet any expected increase in demand, which might reach eight million long tons of phosphoric oxide (P_2O_5) by 1975 (as compared with nearly four million tons of P_2O_5 equivalent in phosphate rock production in 1953). Exploration and development, with improved beneficiation technique, might be expected to maintain commercial reserves ahead of mining.

Turning to potash, the Bureau of Mines stated that approximately 95% of the potash consumed in the United States was used in agriculture — usually in mixed fertilizer. The remaining 5% was consumed by the chemical industry.

The world reserves of soluble potash salts were viewed as large. Although estimates of the tonnage of these reserves varied widely, a reasonable figure would be 37 billion metric tons of K_2O . About 65% of these reserves were in Germany and Russia, 23% in Israel and Jordan, 6% in France, 5% in Spain and 1% in the United States. Recent discoveries in Canada, however, indicated large deposits of potash, and the Yorkshire deposit in the United Kingdom was estimated to contain 100 million to 200 million tons of K_2O .

The potash industry of New Mexico, where about 90% of United States production was located, began operations in 1931. In 1953 United States potash production exceeded apparent domestic consumption by about 100,000 tons of K_2O equivalent. Whereas in 1931 the United States potash industry contributed only 4% of the world supply, in 1953 it produced over 25%.

In considering the outlook for potash, the Bureau saw the necessity of the use of increasing quantities of fertilizers to maintain United States production of agricultural commodities and to increase it. In addition, new industrial uses of potassium compounds might be developed, such as new type explosives and propellants, although the tonnage involved probably would not be large. From 1931 when the mining of potash salts began in New Mexico until 1951, the grade of ore decreased progressively, although there was a slight improvement in 1952 and 1953. Mining of progressively lower-grade ores undoubtedly would continue as the higher-grade beds were depleted and the demand for potash continued to increase. "A long-

range problem — to insure complete self-sufficiency of potash for the United States virtually forever — requires ways to utilize the potash contained in insoluble minerals, rocks and sea water.” In summary, however, it was stated that United States domestic reserves of potash were adequate for many years at the present rate of production. The increased demand for potash in the United States in recent years had been met largely by expansion of the domestic industry. Future increased requirements might be supplied by domestic producers, but the possibility of large imports of potash was a factor that discouraged further expansion.

It seems clear from the Paley Report and the study by the United States Bureau of Mines that the United States is potentially self-sufficient in each of the three major fertilizer materials. This, however, has not prevented the development of Canadian exports of nitrogenous and phosphate fertilizers to the United States valued in 1955 at almost \$45 million. Further, it would appear likely that Canada's exports to the United States will continue to grow with growing United States use of fertilizer. In considerable measure, this expectation rests upon the efficiency of Canadian operations based upon cheap hydro-electric power and the availability of sulphuric acid. Other demands for power may curtail expansion in some parts of the country, but expansion may well take place in the newer mining areas where such use of sulphuric acid would be desired. The markets for all producers may be expected to expand rapidly and those areas in the United States which are located close to Canadian fertilizer producers to continue to look to these producers for their sources of supply. The treatment of the farmer in the United States economy suggests that, in the case of fertilizers as in the case of agricultural machinery, it is unlikely that the present duty-free status will be altered. Accordingly, it is here assumed that Canadian exports of nitrogenous and phosphate fertilizers to the United States will grow at least as rapidly as United States use of these fertilizer materials. It seems reasonable to anticipate that the United States use of fertilizers in 1980 will be at least two and one-half times the 1955 level and probably higher. Accordingly, a conservative expectation would appear to be that Canada's exports of nitrogenous and phosphate fertilizers to the United States will grow from almost \$45 million in 1955 to \$125 million in 1980 (at 1955 prices).

Canada's overseas fertilizer exports have been erratic and projection of the future is difficult. In 1955 these exports were valued at almost \$12 million, and it is here assumed that in 1980 they will be valued at \$25 million. This would mean that total exports of nitrogenous and phosphate fertilizers in 1980 would amount to \$150 million.

Including deposits located at great depth, total reserves in the Saskatchewan potash deposits have been estimated at as high as 100 billion tons — or two to three times total reserves elsewhere in the world. Two companies, the largest United States producer and a Canadian company, expect

to be turning out potash by 1958. In addition, a number of other companies, including other major New Mexican producers, have holdings in the area.³³⁰

It has been estimated that Canadian potash will be able eventually to compete with New Mexican supplies for up to 40% of the United States market. This United States market is currently running at about two million tons a year, and it is being predicted that annual growth will be around 6% a year for the next decade at least. If this rate of growth were maintained, it would mean that the use of potash fertilizer would increase to more than four times its present level in 25 years. It might be suggested that the United States market by 1980 should be of the order of seven million tons a year of which Canada could supply up to three million tons, worth about \$60 million.

The growth of Canadian potash exports to the United States must be in the face of potential United States self-sufficiency and vast reserves existing elsewhere in the world. Canadian reserves, however, are thicker and richer (but also deeper) than those in the United States and, as noted, United States grades have been deteriorating as the richer deposits are mined out. Further, the interest of the large New Mexican companies in the Canadian deposits suggests their expectations of substantial shipments from Canada. Canadian deposits are better located than those in New Mexico for the supply of certain areas in the United States and, as suggested above, it seems reasonable to assume continued duty-free entry of fertilizers into the United States. This is especially so when it is considered that domestic sales from New Mexican mines could double over the next 25 years and still presumably give Canadian potash a very substantial market in the United States.

It is also possible that Canadian potash will be exported to other countries, particularly those in the Far East. The more favourable location of supplies in Yorkshire, Germany and Israel-Jordan, however, suggest that Canada will not likely export potash to the United Kingdom or continental Europe.

In the light of the situation described, it seems not unreasonable that Canada's exports of potash to the United States might reach as much as \$60 million in 1980 and that, in addition, certain exports might go to the Far East. There are, however, various uncertainties in the establishment of a new industry of this nature and it is not yet known what mining problems will be encountered. Therefore, there is here employed a somewhat more conservative estimate of exports of potash in 1980 amounting to \$50 million to all areas, but mostly to the United States. Taken together with other fertilizer exports, this would mean 1980 exports amounting to \$200 million.

³³⁰ See *The Financial Post*, Toronto, October 8, 1955, and March 3 and June 9, 1956.

About \$170 million of these exports would be to the United States and about \$30 million to overseas countries.

27. *Synthetic Rubber*

(a) *Canadian Production and Exports*

Canada's production of synthetic rubber began in 1943. Since that time, output has expanded rapidly, doubling since 1946 to reach almost 104,000 long tons in 1955 and an annual rate of almost 120,000 tons in the first ten months of 1956.³³¹

Canadian trade data showed exports of synthetic rubber among agricultural products for the years 1944 to 1949 inclusive. For subsequent years, however, the provisions of the Statistics Act regarding the non-disclosure of the operations of one firm have been invoked and exports of synthetic rubber have been included with uranium oxide and other exports in the miscellaneous chemicals item. It is possible, however, to derive information about a large part of Canada's exports of synthetic rubber from the import statistics of other countries. Since 1951 the United Nations has published data on commodity trade showing exports and imports by countries of destination or origin.³³² One of the items in the U.N. classification is crude rubber, etc. (including synthetic) and the reporting countries would appear to include most of the important importers of Canadian synthetic rubber. These United Nations data have, however, various shortcomings. In the first place they are not complete; in its *Annual Report* for 1955, Polymer Corporation Limited stated that its rubber is shipped to customers in 40 countries, while the 1955 United Nations data covered only 15 countries reporting imports from Canada. Further, the United Nations data include shipments of reclaimed and scrap rubber, whether natural or synthetic. With respect to the value data, there is the additional difficulty that valuation methods differ from those employed in the Canadian statistics and many countries value their imports on a basis which includes insurance and freight. The volume data, however, can be checked against an estimate of exports based upon other information published by the D.B.S.

Table 8 shows the various available estimates of the quantity of Canada's exports of synthetic rubber. The first six columns show the derivation of data on exports from D.B.S. information on Canadian production, consumption, changes in stocks, and imports. They suggest that Canada's exports of synthetic rubber have risen from about 12,000 long tons in 1944 and 1945 to almost 72,000 tons in 1955. The next column shows the volume of synthetic rubber exports reported in the Canadian trade statistics for the years 1944 to 1949, inclusive. While these data differ somewhat from those derived from figures on production, consumption, etc., such differences

³³¹ D.B.S., *Consumption, Production and Inventories of Rubber*, October 1956.

³³² United Nations, *Commodity Trade Statistics*, published quarterly.

are not unexpected when the results of different reporting techniques are compared. For the years 1948 and 1949 the two export series are remarkably close. The final three columns in the table show data on Canadian exports of synthetic rubber derived from the import statistics published by the United Nations, adjusted to eliminate exports of reclaimed and scrap rubber to the United States. These data might be expected to differ from actual Canadian domestic exports of synthetic rubber because of their limited coverage, etc., and because of the discrepancies which always arise between export and import data covering the same trade.

By value, Canada's exports of synthetic rubber amounted to \$6.5 million in 1944. In 1949, the last year for which synthetic rubber is identified in the Canadian export statistics, the value had risen to \$13.2 million. Except for 1947, the United States was the largest market during these years. Next in importance was France which took about half of Canadian exports in 1947 and almost a quarter of the total value in 1949.

Making allowance for the problems of using the data published by the United Nations, it would appear that the value of Canada's exports of synthetic rubber to the countries covered by those data rose from about \$16 million in 1951 to about \$32 million in 1955.³³³ As an aid to interpreting these data, it may be noted that the 1955 *Annual Report* of Polymer Corporation Limited reported the value of total sales of products and services in 1954 and 1955. The data in columns (1) and (6) of Table 8 suggest that, in these two years, exports accounted for 67% and 69% of total production. Ignoring changes of stocks and sales of services, it may thus be calculated that, if exports were representative of the types of rubber produced, their value was about \$35.7 million in 1954 and \$42.5 million in 1955 (as compared with \$30 million and \$32 million estimated from the United Nations data).

The data published by the United Nations, adjusted to remove imports of reclaimed and scrap rubber by the United States, suggest that the United States continued to be the most important export market for Canadian synthetic rubber from 1951 to 1954, but that 1955 exports to the United States (at 18% of the calculated value) were exceeded by those to France (24%) and to the United Kingdom (22%).

Regarding future production of rubber in Canada, the 1955 *Annual Report* of Polymer Corporation Limited noted that the company had been expanding its facilities. Nevertheless, the upsurge in demand in 1955 necessitated the introduction of a formal system of allocation. It was noted that the synthetic rubber plants in the United States were now owned by many different companies and that plans were advancing for construction of other plants in Europe. Despite such developments and others, including

³³³ Imports of Canadian rubber reported by the United Nations for 1955 were valued at a total of US\$ 35.7 million. Of this, \$356,000 represented reclaimed rubber and rubber scrap or refuse imported by the United States. A further adjustment is necessary to convert the figures from a c.i.f. to an f.o.b. basis.

Table 8

ESTIMATES OF CANADA'S EXPORTS OF SYNTHETIC RUBBER (long tons of 2,240 pounds)

Production (1)	Domestic con- sumption (2)	Change in stocks (3)	Net exports (4) = (1) - (2) - (3)	Imports (a) (5)	Exports (6) = (4) + (5)	Recorded export data (D.B.S.) (7)	Derived export data (U.N.) (8)	U.S. im- ports of reclaimed and scrap rubber (b) (9)	Derived synthetic exports (10) = (8) - (9)
1943	2,520	n.a.		4,644		—			
1944	34,824	1,349	8,743	3,860	12,603	7,441			
1945	45,720	466	9,314	2,648	11,962	10,900			
1946	50,976	1,485	19,875	2,161	22,036	18,751			
1947	42,396	-1,259	14,471	1,461	15,932	19,391			
1948	40,452	115	19,781	913	20,694	20,459			
1949	46,644	230	28,354	1,194	29,548	29,773			
1950	58,440	-1,167	37,035	1,549	38,584				
1951	62,292	160	35,696	1,609	37,305		36,940	9,800	27,140
1952	74,268	3,254	37,426	2,461	39,887		48,216	5,991	42,225
1953	80,928	-2,184	47,196	2,454	49,650		48,516	8,985	39,531
1954	86,580	1,122	55,386	2,760	58,146		58,687	5,198	53,489
1955	103,896	368	63,328	8,578	71,906		64,306	5,670	58,636

(a) "Synthetic rubber, crude, and other rubber substitutes." The Canadian trade statistics also contain an item "Latex, including synthetic latex". Most of the imports of this item have been from the United States with 1943—203, 1944—318, 1945—96. Imports from the United States have been as follows (in long tons): 1949—1,965, 1950—3,078, 1951—3,047, 1952—2,828, 1953—3,730, 1954—3,318, 1955—6,515.

It is difficult to identify these shipments from U.S. export data, but it would appear that most of the item probably covers the re-export of natural latex. For this reason, and the fact that synthetic latex is used to produce paints rather than rubber, the item is ignored in the estimation of Canadian exports.

(b) The U.N. data include imports of reclaimed and scrap rubber as well as synthetic rubber (and natural rubber where appropriate). Such reclaimed and scrap rubber imported from Canada is believed to be "second-hand". Therefore, these imports should be deducted to arrive at appropriate data for exports of synthetic rubber. As Canadian export data show exports of "waste rubber" as going almost entirely to the United States, the amounts deducted are obtained from U.S. import data—amounts received from Canada in the categories "Rubber, reclaimed" and "Rubber scrap or refuse".

SOURCES: D.B.S., *Consumption, Production and Inventories of Rubber*, March 1956 (for cols. 1, (2) and (3)); and *Trade of Canada* (for cols. (5) and (7)); United Nations, *Commodity Trade Statistics* (see col. (8)); and U.S. Department of Commerce, Bureau of the Census, *United States Imports of Merchandise for Consumption*, Report No. FT 110 (for col. (9)).

the contraction of the inner tube market, an optimistic view was taken of the long-term outlook. In the past five years, total world rubber consumption had increased by one-third to 2.9 million long tons per annum. During this period, natural rubber production had remained almost constant at about 1.8 million tons per annum. The inability of natural rubber producers to increase production in the face of rapidly increasing world demand was the chief motivating factor in the expansion of chemical rubber facilities announced by Polymer and other producers.

(b) Canada's Place in World Production and Trade

According to data from the International Rubber Study Group published by the United Nations, world rubber production outside of the U.S.S.R. amounted in 1954 to about three million metric tons. This production was made up approximately as follows: 1.8 million tons of natural rubber, 0.8 million tons of synthetic rubber and 0.4 million tons of reclaimed rubber. The 1,832,000 tons of natural rubber compared with 1,226,000 tons in 1937 and 1,915,000 tons in 1951. Production of 728,000 tons of synthetic rubber covered only the United States (87%), Canada (12%) and Western Germany (1%), excluding the U.S.S.R. and minor producers. A decline in United States production had reduced the amount shown for the three countries from 951,000 tons in 1953. Five countries, estimated to have accounted for nearly 80% of the world's rubber reclaiming capacity in 1952, produced 342,000 tons of reclaimed rubber in 1954. Of this amount, about 76% was produced in the United States, 11% in the United Kingdom, 10% in Western Germany, 2% in Australia and 1% in Canada.³³⁴

Later data show that the production of both natural and synthetic rubber rose in 1955. In that year natural rubber production was 1,943,000 metric tons, as compared with 1,831,000 tons in 1954. The United States, Canada and Western Germany each increased synthetic production in 1955 to a total of 1,103,000 tons as compared with 728,000 tons in 1954. Production in 1955 was divided as follows: 89% in the United States, 10% in Canada and 1% in Western Germany.³³⁵

The United States is much the world's largest consumer of both natural and synthetic rubber. According to United Nations data (from the International Rubber Study Group), in 1954 the United States consumed 34% of the natural rubber used outside of the U.S.S.R. and 86% of the synthetic rubber. The next largest consumers of natural rubber were the United Kingdom, Western Germany, France, Japan, Italy, Australia and Canada, in that order. Other significant consumers of synthetic rubber were Canada with about 4% of the 1954 total, the Federal Republic of Germany and France with about 2% each, and Italy and the United Kingdom with about 1% each.³³⁶

³³⁴ United Nations, *Statistical Yearbook*, 1955.

³³⁵ United Nations, *Monthly Bulletin of Statistics*, July and September, 1956.

³³⁶ United Nations, *Statistical Yearbook*, 1955.

The trade data published by the United Nations include together natural, synthetic, reclaimed, scrap and waste rubber. It may be assumed, however, that the United States and Canada are the only important exporters of synthetic rubber and that most of the value of their shipments is accounted for by synthetic. In 1955 the value of United States exports of crude rubber, etc. was US\$ 66 million, as compared with imports from Canada by reporting countries aggregating US\$ 36 million. Among important markets, imports from the United States exceeded those from Canada in the cases of the United Kingdom, Western Germany, the Netherlands, Sweden, Italy and Japan. On the other hand, imports from Canada by Austria, Belgium-Luxembourg and France were greater than those from the United States.³³⁷

(c) *Market Outlook*

The Paley Report stated that in 1950 the United States consumed about 1.6 million long tons of new and reclaimed rubber, an all-time peak. Transportation, chiefly pneumatic tires, absorbed about two-thirds of this consumption. During 1950 the United States produced 476,000 tons of synthetic, less than half its capacity at the time the Report was written, and 313,000 tons of reclaimed rubber. Its net imports amounted to 803,000 tons, mostly natural rubber. Synthetic rubber production amounted to 36% of new rubber consumption in 1950 and to 74% in 1951 when much of the imported natural rubber went into the stockpile. It was expected that United States consumption of new and reclaimed rubber might reach 3.3 million long tons by 1975. This doubling of demand would, however, represent a lower rate of increase than had occurred during the preceding 25 years, when consumption tripled. Greater use of reclaimed rubber was expected to mean that, while the total consumption of rubber increased by 104% between 1950 and 1975, the consumption of new rubber would increase by 89% (from 1.3 million tons to 2.5 million tons).³³⁸

In 1950 consumption of rubber in other countries outside the Soviet bloc amounted to about 950,000 long tons, of which 785,000 was natural rubber, 125,000 reclaimed and 40,000 synthetic. Natural rubber production was about 1,855,000 long tons; synthetic 58,000; and reclaimed about equal to its consumption, 125,000 tons. The excess production of 1.1 million tons, mostly natural rubber, covered net shipments to the United States and to countries outside the free world. If automotive transportation grew at about the same rate as it had in the United States in the period 1925-50 and if other uses of rubber also expanded rapidly, rubber consumption in the rest of the free world would triple over the period 1950-75, while that of the United States doubled. Allowing for a roughly corresponding

³³⁷ United Nations, *Commodity Trade Statistics*, January-December 1955.

³³⁸ *Paley Report*, Vol. II, pp. 99-100, 118 and 126. Unless otherwise noted, references to the Report in the text are to Vol. II, Chap. 20 (pp. 99-103).

increase in production of reclaimed rubber, the demand for new rubber in the rest of the free world was taken as reaching about 2.5 million long tons by 1975, compared with 825,000 tons in 1950.³³⁹

In terms of physical potential alone, natural rubber production could be expanded substantially over the period 1950 to 1975. While the 1950 rate of production, 1,855,000 long tons, could be doubled by 1975, conditions in the industry, political conditions in producing countries, and the competitive force of synthetic rubber suggested the greater likelihood that the expansion of natural rubber production might be at a rate which would bring it to a maximum of 2.5 million tons at best by 1975. On the other hand, it was felt that the growing demand for new rubber could readily be met by expanding synthetic production, and that increasing synthetic supplies would bring down the price of natural rubber.

The projected free world demand for new rubber totalled some five million long tons by 1975. If natural rubber production expanded to what appeared to be the most reasonable outside limit of 2.5 million long tons by 1975 and if the Soviet sphere purchased in 1975 no more than the 200,000 tons taken in 1950, free world consumption would be divided into 2.3 million tons of natural rubber and 2.7 million tons of synthetic. This production of synthetic rubber would compare with slightly over one-half million tons in 1950 and less than one million tons in 1951. The share of synthetic in new rubber production would rise from 25% in 1950 to 55% in 1975, or more if the Soviet countries purchased an increasing amount of natural rubber. It was not possible to estimate just how the synthetic rubber capacity would be distributed as between the United States and other free countries, but it was felt that national security and economic considerations would lead to an appreciable expansion of synthetic rubber capacity outside the United States.

Other considerations on the demand side support the Paley Report's conclusion that future rubber consumption in the free world will include a higher proportion of synthetic. To the extent that they use synthetic rubber, manufacturers are able to escape the problems created by the violence of the fluctuations in the price of natural rubber. This had led to a preference for synthetic rubber even when the relation of the spot prices would suggest that natural rubber was more economic. Also, there have been many occasions in recent years when natural rubber was clearly much more expensive. Another consideration emerges from the examination of consumption statistics. In 1954, 52% of United States new raw rubber consumption consisted of synthetic and 48% of natural rubber. In the rest of the world outside the U.S.S.R., however, only 8% of total consumption was represented by synthetic rubber. Of the countries listed by the United Nations, only Canada, where synthetic accounted for 42% of

³³⁹ *Ibid.*, Vol. II, pp. 101, 132 and 135.

total consumption, approached the position of the United States.⁸⁴⁰ The price advantages of synthetic rubber, as well as its technical advantages in the manufacture of automobile tires and in other uses, suggest that overseas countries will tend to employ an increasing proportion of synthetic in their total rubber use.

The Paley Report suggested that the 1975 free world consumption of synthetic rubber would be at least 2.7 million long tons. As has been noted, in 1955 the United States, Canada and Western Germany produced 1.1 million metric tons of synthetic rubber or about the same amount in long tons. This production was only 19% above the level of 1951. It thus seems reasonable to anticipate that over the next 25 years free world consumption of synthetic rubber will increase to at least two and one-half times its present level and probably more. It also seems reasonable to anticipate that new facilities for the production of synthetic rubber will be developed in many countries. Canada, however, will probably continue to export substantial quantities. The capital costs involved in the production of synthetic rubber are substantial and, in many areas, production is unlikely to keep up with the growth in demand. Canada has the advantage of existing modern facilities in the midst of a developing petrochemical industry in the Sarnia area and can be expected to remain in the forefront of technological developments, such as the development of new types of rubber for specific uses. Further, Canada has available feedstocks and, like the United States, may develop production facilities close to the source of supply. Thus it is here projected that Canada's exports of synthetic rubber will grow from their 1955 level of perhaps \$40 million to about \$100 million in 1980. In view of the large United States production facilities and the probability of their expansion, it is anticipated that most Canadian exports will, as at present, go to overseas countries.

28. *Other Chemicals*

(a) *General Export Position*

The group "chemicals and allied products" in the Canadian export statistics includes fertilizers, synthetic rubber, uranium and, in addition, a large number of other chemicals and allied products.

Domestic exports of chemicals and allied products other than fertilizers amounted to \$12 to \$14 million in each of the years 1926 to 1929. In 1937 the value was \$15 million. Of the \$154 million recorded for 1955, it has been estimated that perhaps \$40 million consisted of synthetic rubber and about \$25 million of uranium. This would mean that exports of what are here called "other chemicals" amounted to about \$90 million.

In addition to some \$37 million of unidentified chemicals (after eliminating estimates for synthetic rubber and uranium), the trade statistics

⁸⁴⁰ United Nations, *Statistical Yearbook, 1955*.

identify exports of "other chemicals" aggregating \$52 million in 1955. The most important of the identified items were cellulose products, exported to a value of \$14.2 million. Other important items were: soda and sodium compounds (lye, baking powder, caustic soda, sodium sulphate and, most important, soda and sodium compounds, n.o.p.) valued at \$8.3 million; polystyrene at \$7.0 million; synthetic resins at \$6.1 million; drugs, medicinal and pharmaceutical preparations at \$4.2 million; cobalt oxides and salts at \$2.9 million; calcium compounds at \$2.8 million; acids at \$1.9 million; paints, pigments and varnish at \$1.7 million; and synthetic resin manufactures at \$1.2 million. With the exception of acids, all of these items showed substantially larger export values in 1955 than in 1937.

While the allocation of exports of synthetic rubber among customer countries creates difficulties, it is clear that the United States was Canada's most important customer for "other chemicals" in 1955, when the share going to that country appears to have been in the order of 40%. Even allowing for exports of synthetic rubber at \$6 million and uranium at \$25 million, Canada's exports of "other chemicals" to the United States were predominantly in the miscellaneous item which contained about \$24 million of the \$36 million total to that country. The most important identified item was soda and sodium compounds, valued at \$6.7 million out of total exports to all countries of \$8.3 million. The United States also took \$1.4 million of total exports of acids amounting to \$1.9 million, and \$1.0 million of the \$1.7 million exports of paints, pigments and varnish. In the other major identified items, the United States share was relatively small.

In 1937 the United Kingdom was Canada's most important market for "other chemicals", with exports amounting to \$5.2 million as compared with \$4.7 million going to the United States. In 1955 it is calculated that, after allowing for exports of synthetic rubber at \$7 million, Canada exported "other chemicals" to the United Kingdom to the value of \$13 million. The \$7.8 million of identified items included \$2.9 million of cobalt oxides and salts, almost all of Canada's exports of this item; \$2.3 million of synthetic resins, for which the United Kingdom was much the largest market; and \$1.6 million of calcium compounds, or over half of total exports of this item. All of these exports were sharply up from 1937. On the other hand, declines were registered in United Kingdom purchases of acids; cellulose products; drugs, medicinal and pharmaceutical preparations; paints, pigments and varnish; soap; and, although the item was of little importance in 1937, soda and sodium compounds.

Mexico would appear to have been the third most important market for Canada's exports of "other chemicals" in 1955. Total exports of chemicals and allied products other than fertilizer to Mexico amounted to \$8.0 million. Of this, \$6.3 million consisted of cellulose products (44% of total exports of such products) and \$1.3 million of miscellaneous chemicals. It is not known to what extent the latter item may have included synthetic

rubber. Other Latin American and West Indian markets were also important, with cellulose products to Colombia and Venezuela standing out.

While the countries of continental Western Europe have purchased substantial values of chemicals and allied products other than fertilizers, a large proportion of this would appear to have consisted of synthetic rubber. Probably the largest continental purchaser of "other chemicals" in 1955 was Norway. Exports to Norway amounted to \$3.8 million and, although this amount is contained almost entirely in "other chemicals and allied products, n.o.p.", U.N. data show imports of Canadian synthetic rubber by Norway at only \$0.1 million.

(b) *Canadian Production*

Data published by the D.B.S. show that the gross selling value of products produced by the chemicals and allied products industries was \$118 million in 1920 (including fertilizers). For the next two decades the value rose unsteadily and fairly slowly. In 1929 it was \$139 million and, in 1937, \$149 million. With the stimulus of war, the value rose to \$765 million in 1943, but it fell to \$376 million in 1946 (when synthetic rubber was also included). Subsequently the value has increased rapidly, and the preliminary figure for 1955 was \$1,049 million.³⁴¹

Making an adjustment to eliminate fertilizers and synthetic rubber from data on production of chemicals in Canada, it would appear that production of "other chemicals" had a value of \$136 million in 1929, \$139 million in 1937 and about \$895 million in 1955. Production and exports of "other chemicals" have increased by roughly similar proportions since the prewar period; the value of exports in 1929 was 10.5% of the value of the production of such chemicals; in 1937 the figure was 10.9%; and in 1955 it is estimated to have been 10.0%.³⁴²

Data are not available in a form which enables a detailed comparison of production and exports by major export commodities in the "other chemicals" group. Available data do indicate, however, that exports play a relatively small role with respect to some of the more important chemicals produced in Canada, e.g., medicinals and pharmaceuticals, paints and varnishes, soaps and washing compounds, toilet preparations, inks, and polishes and dressings. On the other hand, 1955 production of primary plastics was valued at \$75.5 million, whereas exports of polystyrene, synthetic resins and manufactures aggregated \$14.4 million and all cellulose products had about an equal value.³⁴³

³⁴¹ D.B.S., *Chemicals and Allied Products, Preliminary Summary Statistics, 1955*; and *Chemicals and Allied Products, 1953, General Review*.

³⁴² D.B.S., *Chemicals and Allied Products, Preliminary Summary Statistics, 1955*; and *The Fertilizer Industry, 1954*; Polymer Corporation Limited, *Annual Report, 1955*.

³⁴³ D.B.S., *Chemicals and Allied Products, Preliminary Summary Statistics, 1955*; and *Trade of Canada*.

(c) *Canada's Place in World Consumption and Trade*

In the brief presented to the Commission by Canadian Industries Limited, it was stated that the output of chemicals and allied products in Canada was only about one twenty-fourth that of the United States, whereas manufacturing production in this country was better than one-fifteenth the U.S. total. Comparisons with other countries, such as the United Kingdom and Germany, showed similar relationships. This disparity was almost entirely attributable to lower production of organic chemicals in Canada; Canada's output of heavy industrial chemicals amounted to one-fourteenth of the United States output.³⁴⁴ Du Pont of Canada in its brief noted that the rate of Canadian growth in the postwar period had not been as great as that in the United States. Nor had the Canadian industry maintained its position *vis-a-vis* the rest of the world. Germany and other countries were rapidly building a new modern chemical industry to replace the facilities destroyed by war.³⁴⁵

According to data published by the United States Department of Commerce, sales by chemical manufacturers in the United States, including sales from one manufacturer to another, amounted to \$23.0 billion in 1955. United States exports of chemicals and related products (excluding "special category" commodities) amounted to \$1,075 million, while imports were \$255 million. Of these imports, \$88 million, or 34%, are reported as having come from Canada, while Western Europe supplied 44% of the total. Although it would appear that United States import data do not include synthetic rubber, abrasives or uranium in the chemical group, they do include fertilizers. If fertilizers are excluded, 1955 imports from Canada amounted to \$36.8 million or 25% of the total of \$144.8 million.³⁴⁶

Including artificial abrasives and fertilizers, but excluding synthetic rubber and uranium, United Kingdom 1955 imports of chemicals amounted to £112.3 million. Canada was the fourth most important supplier of these chemicals. The major suppliers were as follows: the United States, £26.0 million; Western Germany, £16.4 million; France, £11.9 million; Canada, £8.6 million (of which abrasives and fertilizers accounted for perhaps £1.5 million); Switzerland, £6.8 million; and the Netherlands, £6.2 million. Within the chemicals group, imports of plastic materials are shown as valued at £12.0 million. Of this amount, £6.5 million came from the United States, £2.3 million from Western Germany and £1.2 million from Canada.

(d) *Market Outlook*

In its chapter on chemicals, the Paley Report suggested that the quantity of prime and intermediate chemicals needed by 1975 to supply needs related

³⁴⁴ H. Grenville Smith, President, Canadian Industries Limited, *The Chemical Industry*, a Statement to the Royal Commission on Canada's Economic Prospects, Montreal, February, 1956, p. 7.

³⁴⁵ H. H. Lank, President, Du Pont Company of Canada Limited, *Growth Potentialities of the Canadian Chemical Industry*, a Submission to the Royal Commission on Canada's Economic Prospects, p. 11.

³⁴⁶ U.S. Department of Commerce, *Survey of Current Business*, March 1956; *Foreign Commerce Weekly*, April 30, 1956, pp. 13-14; and Bureau of the Census, *Report No. FT 110, United States Imports of Merchandise for Consumption, Commodity by Country of Origin*, Calendar Year 1955.

to food, clothing, shelter, transportation and communication, medication, and tools, machinery and equipment would have to be nearly three and perhaps four times that consumed in 1950. The minimum increase suggested would, of course, not apply to all types of chemicals: some, such as pigments, dyes and industrial explosives, would hardly increase twofold, whereas the synthetic polymer materials probably would increase between five- and tenfold. Given time, there should be plenty of all the raw materials required for the chemical industry in the United States, although in some cases at a slightly higher cost. From 1939 to 1949 the United States chemical industry grew by 200%, while total United States industrial production rose by only 61%. On the assumption that this relative growth would continue over the next 25 years, a doubling of the total value of all goods and services would mean that the chemical industry as a whole would be about four times its 1950 volume in 1975.³⁴⁷

A forecast of Canadian chemical exports was contained in the brief submitted to the Commission by Du Pont of Canada. On the basis of a correlation analysis, it was estimated that a 1975 G.N.P. of \$57 billion should give rise to an internal market of \$3.4 billion for chemical products, or three and one-half times that of 1955. Considering exports, it was noted that the total volume of goods shipped abroad, expressed as a percentage of total domestic consumption, has remained relatively constant, except for the war years. The struggle to maintain Canada's position in the export field had been greater than might be apparent in the trade statistics. Her postwar success in foreign markets was attributable in no small way to an ability to discern world shortages in particular areas and to win out in the race to supply such needs. Such opportunities were likely to become less frequent with the spread of industrialization and the re-emergence of Germany and Japan as formidable competitors. Also the foreign trade policies of other countries were designed to prevent the importation of products in which Canada had a definite economic advantage. Nevertheless, "although foreign markets are not too promising, exports expressed as a percentage of total domestic demand should remain relatively constant. On this basis it is estimated that the value of exports by 1975 will reach an estimated \$600 million."³⁴⁸ This amount presumably included fertilizers and synthetic rubber.

Another forecast of the growth of Canada's chemical industry was given by C. R. Graham, Director of Market Research, J. T. Donald and Company, Montreal, who stated in January 1956 that he would expect the Canadian chemical and allied products industry to expand two and one-half times by 1975. This was based on the assumptions that there would be no major economic depression, an enlightened immigration policy and fair

³⁴⁷ *Paley Report*, Vol. II, Chap. 21, pp. 103-107.

³⁴⁸ H. H. Lank, *op. cit.*, pp. 4-6. A similar export figure was presented in a more recent address to the Chemical Market Research Association by the manager of Du Pont's Chemical Department (*The Financial Post*, Toronto, October 13, 1956).

tariff treatment for the Canadian industry. With shortages of raw materials increasing all over the world, the prospect for greater export of Canadian chemicals was becoming brighter. Canadian chemical raw materials were inexpensive and plentiful — petroleum, natural gas, potash and new sources of sulphur were being found. Canadian technology was as advanced, and Canadian manufacturing costs as low, as any other country's. Thus Canadian chemicals should be competitive anywhere.³⁴⁹

Other submissions to the Commission stressed the difficulties facing Canada's chemical exports. Thus the brief from Canadian Industries Limited drew attention to the high tariffs in the United States and the United Kingdom. The brief from Shawinigan Chemicals Limited said that it would be quite unrealistic to predicate our industrial future on an expansion of our export trade. The United Kingdom, the Commonwealth countries and other nations of the world with which Canada had enjoyed export business were rapidly building up integrated chemical industries to supply their own needs. Furthermore, it was felt to be doubtful whether Canada should rely to any extent on improved trade relations with the United States as far as the export of manufactured or semi-finished goods was concerned.³⁵⁰

Projections of growth of total output of Canada's chemical industry and of exports are generally not wholly appropriate for the purposes of this section as they usually include fertilizers and synthetic rubber. It is also possible that the inclusion of uranium in the statistics of present chemical exports produces an upward bias in forecasts of exports in the future. It has been noted that 1955 exports of "other chemicals" as here defined may be estimated at about 10% of production. Production of these "other chemicals" seems likely to increase severalfold between 1955 and 1980. In the light of restrictions on international trade in non-agricultural chemicals and the competition of exporters in countries with more highly developed chemical industries than has Canada, it may be, particularly if Canadian output grows very rapidly, that exports will decline as a percentage of output. In the light of the foregoing examination and drafts of the Commission's study on *The Canadian Chemical Industry*, it is suggested that Canada's exports of "other chemicals" will amount to \$300 million in 1980 — three and one-third times the estimate of \$90 million in 1955. The achievement of such exports in the face of restrictions to trade should be aided by the Canadian raw material position and should be easier to the extent that important branches of the Canadian industry can remain at or near the forefront of world progress.

The projections in this and other sections of Part B are that exports of all items presently covered under "chemicals and allied products" in the export statistics will rise from \$210 million in 1955 to \$800 million in

³⁴⁹ *The Financial Post*, Toronto, January 14, 1956.

³⁵⁰ H. Grenville Smith, *op. cit.*, pp. 12-13; and R. S. Jane, Shawinigan Chemicals Limited, *Submission to the Royal Commission on Canada's Economic Prospects*, p. 15.

1980. The 1980 figure is made up of \$200 million for uranium, \$200 million for fertilizers (including potash fertilizers), \$100 million for synthetic rubber and \$300 million for "other chemicals".

29. Sundry Manufactures

The items covered in this section can best be seen from the following table in which they are listed along with the export values for the years 1937, 1952, 1954 and 1955.

Canada's Domestic Exports of Sundry Manufactures (thousands of Canadian dollars)

	1937	1952	1954	1955
Alcoholic beverages.....	21,175	56,597	62,638	64,629
Rubber products.....	17,618	17,455	10,863	9,439
Textiles and products.....	12,945	25,206	19,252	21,360
Electrical apparatus.....	2,784	33,892	22,913	20,700
Engines and boilers.....	273	10,222	23,647	30,080
Farm machinery and implements..	9,839	105,408	76,771	76,010
(including farm tractors).....	(a)	(9,716)	(5,952)	(3,803)
Non-farm machinery.....	10,837	47,378	36,676	35,789
Automobiles, trucks and parts....	26,783	111,015	27,103	39,779
Other vehicles, chiefly of iron.....	236	4,059	4,374	6,573
(including tractors).....	(25)	(2,066)	(1,415)	(1,949)
Guns, rifles and other firearms....	22	5,627	39,549	4,129
Railway track material of iron and steel } ..	9,367	14	8	3,578
Other mfgs. of iron and steel(b) }		16,274	9,893	10,929
Ships and vessels.....	626	11,630	8,755	6,311
Aircraft and parts.....	265	37,503	28,442	19,906
Cartridges, gun and rifle.....	154	10,139	13,804	3,565
Total.....	112,924	492,419	384,688	352,777

(a) Included in "other vehicles, chiefly of iron".

(b) Remaining items in the "iron and its products" group in the export statistics after the exclusion of items in this listing, together with iron ore, and primary iron and steel (including scrap).

For the group as a whole, exports in 1928 amounted to \$133 million or 9.6% of total domestic exports, including gold. In 1937 the value, at \$113 million, was below the 1928 level, but this represented the same proportion of total exports as had the higher value in 1928. In the first postwar year, 1946, these exports aggregated \$351 million or 14.6% of Canada's total domestic exports, including gold. In all but one of the subsequent years up to 1955, the value exceeded that achieved in 1946 but nevertheless was a smaller percentage of total exports. The largest value of sales occurred in 1952 when they totalled \$492 million or 11.1% of total exports. Subsequently sales have declined and in 1955 they were down to \$353 million

or 8.0% of total domestic exports, including gold. For the group as a whole, \$199 million or 56% of the \$353 million exports in 1955 went to the United States. The United Kingdom took only \$5 million or approximately 1.5%.³⁵¹

Canada's exports of *alcoholic beverages* were valued at \$28 million in 1928, \$21 million in 1937, and reached \$66 million in 1953. In 1955 the value was \$64.6 million, but it amounted virtually to this figure in the first 11 months of 1956. Of the 1955 exports, 94% consisted of whisky and most of the remainder of ale, beer and porter. The United States market accounted for 89% of the value of 1955 exports of whisky and for 94% of the ale, beer and porter. Most of the remaining shipments went to Japan, the Federal Republic of Germany and the United Kingdom, and appear to have been related to the stationing of Canadian and United States forces in those areas.

Although Canada's exports of ale, beer and porter have increased manifold since 1937, exports of whisky, while almost triple the 1937 value, were in 1955 only 31% above the 1937 volume. Exports of ale, beer and porter would appear to be only slightly more than 1% of total shipments by the Canadian brewing industry.³⁵² On the other hand, it would appear that exports accounted for 71% of 1955 sales of whisky outside the distilling industry.³⁵³

United States production of whisky has fluctuated widely. Tax paid withdrawals in 1955, however, were less than in 1940, 1941 and 1942, and only 4% above the level in 1936. Meanwhile, United States imports increased by 63% between 1936 and 1955 and in 1955 appear to have been about one-third of tax paid withdrawals. The import market is shared between Canada and the United Kingdom, with the United Kingdom somewhat ahead of Canada in both value and volume.³⁵⁴

United States consumption of legal whisky appears to have been dropping. Yet imports from Canada have increased somewhat, and it may be suggested that Canadian whisky, as a prestige product, is less affected by the decline in per capita consumption or by the apparent increase in the consumption of illegal whisky. For the future, Canada's exports of whisky might perhaps be expected to increase approximately with the increase in United States adult population or slightly faster. Any such forecast, however, must be qualified by the possibility of a change in taste, affecting either whisky consumption as a whole or the share of Canadian whisky in the total United States market. Despite the United States tariff,

³⁵¹ Significant changes in 1956 are noted in the following discussion of the individual items.

³⁵² D.B.S., *The Brewing Industry, 1954*.

³⁵³ D.B.S., *The Distilling Industry, 1955*.

³⁵⁴ U.S. Department of Commerce, *Business Statistics 1955, Supplement to the Survey of Current Business; Survey of Current Business*, March 1956; and Report No. PT 110, *United States Imports of Merchandise for Consumption, Commodity by Country of Origin, Calendar Year 1955*.

the export of Canadian whisky to the United States would appear to be a profitable business, as suggested by the entry of United States distillers into Canada. On the other hand, certain United States distillers have complained about alleged practices by the Canadian firms and have argued that the United States tariff ought to be increased.³⁵⁵ Assuming, however, that there will not be any significant change in tastes or a significant change in United States policy affecting imports, it is suggested that Canada's exports of alcoholic beverages will increase slightly more rapidly than the 40% increase in United States adult population which is expected between 1955 and 1980.

In 1928 Canada's exports of *rubber products* amounted to \$30 million. In 1937 they were \$18 million and in 1951 they reached their postwar peak of \$28 million, from which they fell to less than \$10 million in 1955. Of the \$17.6 million exported in 1937, \$9.5 million was accounted for by vehicle tires, pneumatic tire casings and inner tubes, and \$5.5 million by boots and shoes. The United States was a relatively unimportant market for these exports which went to a large number of countries, the most important of which were the United Kingdom with \$5.6 million (\$4.1 million boots and shoes), New Zealand with \$2.3 million and Brazil with \$1.0 million. In 1955, \$7.1 million of the \$9.4 million of total exports of rubber products consisted of tires, etc. Again exports went to many countries, but sales to the United Kingdom aggregated only \$299,000, those to New Zealand amounted to \$267,000, and Brazil purchased only \$29,000. Sales to the United States, however, amounted to \$3.4 million, of which \$2.6 million consisted of tires, pneumatic casings and inner tubes.

Canada's exports of rubber products have been affected by restrictions limiting imports, and this has only in part been offset by the increase in sales to the United States. Protectionism can be expected to continue and, while it is possible to anticipate that there will be some increase in exports of these commodities, it would seem unlikely that the peak values achieved in the past will again be reached on a stable basis during the period covered by this investigation.

Canada's exports of *textiles and products*, excluding natural fibres, almost doubled in value from 1928 to 1937 when they amounted to \$12.9 million. In 1946 these exports amounted to \$50 million, somewhat below the wartime peaks achieved in the two previous years. Subsequently they fell to \$23 million in 1949, rose to \$34 million in 1951 and then declined to \$19 million in 1954. In 1955 they were \$21.4 million. Commonwealth countries accounted for the bulk of Canada's 1937 exports, with 24% going to the United Kingdom, 17% to the Union of South Africa, 16% to Australia and 8% to New Zealand. The only other market of comparable importance was the United States, to which country exports amounted to \$2 million

³⁵⁵ See, for example, *The Financial Post*, Toronto, December 3, 1955.

or 15% of the total. Of the \$21.4 million in 1955, \$5.2 million consisted of binder twine, rope, fish nets and other cordage and twine. In addition, cotton and products accounted for \$3.1 million, wool rags and waste for \$2.9 million, other wool manufactures for \$1.5 million, synthetic fibre thread and yarn for \$2.6 million, and synthetic fibre manufactures for \$1.6 million. Commonwealth countries no longer dominated the market. In 1955 the United Kingdom took only 4.6% of total exports, and the Union of South Africa, New Zealand and Australia accounted in total for only 3.5%. Markets in continental Western European countries, however, had become more important and exports to France, almost entirely synthetic fibre, were 5.4% of the total. The greatest change, however, was the increase in exports to the United States to \$9.6 million or 45% of the 1955 total. Of this amount, \$2.8 million consisted of cotton, jute, wool and other rags and waste, and \$4.3 million of binder twine, rope, fish nets and other cordage and twine.

The specialty exports such as those going to the United States may be expected to increase in the future and it may be that exports of certain new lines are possible. Most countries, however, protect their textile industries, and textile manufacturing is one of the first industries set up by countries seeking economic development. Thus it is felt that there cannot be more than a relatively modest increase in Canada's total exports of these products.

Canada's domestic exports of the *electrical apparatus* items in the non-ferrous metals group in the trade statistics have increased substantially since before the war. From \$2.8 million in 1937, they rose to a wartime peak of \$72 million in 1944 and to a postwar high of \$37.7 million in 1953. In 1955 they stood at \$20.7 million. Of the 1955 total, \$5.8 million consisted of radio receiving sets and other radio apparatus; \$2.1 million of telegraph and telephone apparatus; \$1.6 million of transformers and parts; \$1.4 million of dynamos, generators and parts; \$1.4 million of electric meters and parts; \$1.3 million of electric motors and parts; and \$2.1 million of spark plugs. The category does not include: electric vacuum cleaners, and washing machines and parts, exports of which in 1955 aggregated \$1.0 million and which are included hereinafter with non-farm machinery; electric stoves, and electric heating and cooking devices and parts, exports of which in 1955 were \$490,000 and are included hereinafter with other manufactures of iron and steel; or refrigerators and parts covered among the miscellaneous exports in Section 30, exports of which amounted to \$529,000 in 1955. Similarly, a number of other items in the use of which electricity is involved and items related to the use of electricity, such as copper wire, are not included here with electrical apparatus.

Of the 1955 exports classified in the trade statistics as electrical apparatus, 36% went to the United States, 14% to Brazil, 10% to India and about 4.5% each to Mexico and the Union of South Africa. Exports to the United Kingdom were less than 1%, although in 1953 they had been 16% or almost

\$6 million. In that year also, exports to Italy and the Netherlands exceeded \$1 million as had exports to France in the previous year. In 1955, however, exports to each of these countries were relatively small.

The Canadian electrical manufacturing industry is considered in a separate study which has been prepared for the Commission. The coverage in that study is broader than electrical apparatus as isolated in the trade statistics, including refrigerators, washing machines, electric stoves, vacuum cleaners and copper wire and cable.³⁵⁶

The study notes that in 1954, Canadian manufacturers of electrical apparatus sold only 3% of their output in export markets, as compared with 5% to 6% in the late 1930's and in some of the early postwar years. This relative decline is stated not to reflect any relative lag in the efficiency of Canadian manufacturers, but to be due to the import restrictions of many countries, to the currency devaluations and to the increased tariffs and other trade barriers that have accompanied the industrialization programmes of many underdeveloped countries. The significance of the recovery of Germany and other countries is also mentioned. Further, experience indicates that the export market is not very dependable. In Commonwealth markets, it is felt that Canadian manufacturers could not regain their former position even if import restrictions were removed. If Canadian manufacturers could gain tariff free access to the United States market on products in which they have some advantage, they could specialize and develop a substantial market. Barring such a development, however, no significant market is felt likely to develop.³⁵⁷

The study suggests that the electrical manufacturing industry in Canada is likely to continue the very rapid rate of growth which it has experienced in the past. While Canadian firms will continually find themselves at a disadvantage on newer products, etc., as the domestic market expands, they should be better able to compete on even terms with manufacturers in the United States on a wider and wider range of products. While it is stated that no precise estimates are possible, it is suggested that the total output of the Canadian industry might grow at an annual rate of about 7% per annum. But, although exports will continue to be important in a few lines, it is felt that they are unlikely to be of major importance for a long time to come.³⁵⁸

If the Canadian electrical manufacturing industry were to increase its output at a rate of 7% per annum, this would mean that output would grow to about five and one-half times its present level over a 25-year period. It cannot be anticipated that exports will keep pace with any such increase in output. Nevertheless, the vigour of the Canadian industry should make

³⁵⁶ Clarence L. Barber, *The Canadian Electrical Manufacturing Industry*.

³⁵⁷ *Ibid.*, Chap. 4.

³⁵⁸ *Ibid.*, Chap. 5 and 6.

possible some exports and, indeed, should facilitate substantial growth. Perhaps a tripling of Canadian exports from the presently reduced level would represent a not unreasonable expectation.

Amounting to less than half a million dollars in the years immediately preceding the war, Canada's exports of *engines and boilers* have been of considerable significance in the postwar period, fluctuating between \$10 million in 1951 and \$31 million in 1949. These exports encompass internal combustion engines and parts, steam engines and parts, and locomotives and parts. The nature of the commodities has meant that there has been wide year-to-year fluctuation, not only in the total value of exports but also in the relative importance of different markets. Of the \$30 million of exports in 1955, 58% consisted of internal combustion engines and parts to a long list of countries, 41% of locomotives and parts, and 1% of steam engines and parts. Thirty-nine per cent of these exports went to the United States (largely internal combustion engines), while 37% went to India (largely locomotives). In addition, 6% went to New Zealand (73% locomotives) and about 2% each to Malaya and Singapore and the United Kingdom (entirely internal combustion engines in each case).

The postwar period would appear to demonstrate Canada's ability to export these commodities and it may be expected that the future will bring a substantial further growth with, however, many interruptions to the movement. As with other manufactured commodities, sales of locomotives to underdeveloped countries may, in some measure, turn on continued assistance to the development of these countries in the form of credits either from Canada or from other sources.

The Canadian *agricultural machinery* industry is another line of activity in the manufacturing field where exports increased very greatly from the prewar to the postwar period. In 1928 Canada's exports of farm machinery and implements amounted to over \$14 million. In 1937, they were less than \$10 million, but they rose to \$106 million and \$105 million, respectively, in 1951 and 1952. After 1952, however, exports fell sharply and in 1955 amounted to \$76 million. In the first 11 months of 1956 they were almost \$6 million below the level in the same months in 1955. Exports of agricultural machinery cover a wide variety of items. Much the most important in 1955 were reaper-threshers or combines, valued at \$30 million, an item which presumably includes the important self-propelled combine developed by Massey-Harris in the postwar period. Other important exports in 1955 included milking machines and parts at \$1.4 million, hay rakes at \$1.5 million, mowing machines and reapers at \$3.3 million, cultivators at \$1.3 million, drills and sowers at \$4.2 million, disc harrows and parts at \$2.8 million, disc plows and parts at \$3.2 million, other plows and parts at \$3.9 million and farm tractors at \$3.8 million.

In 1937, as generally in the prewar period, overseas markets were more important to the Canadian industry than were those in the United States.

In that year sales to the United States accounted for 34% of total exports, those to Argentina for 25%, those to the Union of South Africa for 13%, and those to the United Kingdom for 12%. In every postwar year, however, sales to the United States have accounted for over half of total Canadian exports. In 1955 the United States took 83% of total exports, France 3%, and Mexico and the Union of South Africa about 2% each.

The study of the Canadian agricultural machinery industry prepared for the Commission deals with this industry as one which faces no tariff in the United States (since 1913) or in Canada (since 1944). The competitive position of the Canadian industry is strengthened by the fact that it can import free of duty any materials or tools required for the production of agricultural machinery. As regards overseas markets, however, sales are curtailed by exchange and other restrictions.³⁵⁹

The study notes that before 1939 slightly less than 40% of Canadian agricultural machinery production was exported. After 1939 exports increased to about 50% and in 1954 the figure was over 60%. Three main reasons are offered for the increase in exports to the United States and the decline to other countries in the postwar period. These are overseas exchange restrictions leading Massey-Harris, for example, to establish plants in certain countries; the integration of manufacturing operations of the companies with plants on both sides of the United States border, resulting in a substantial increase in both exports and imports; and the intensified sales efforts in the United States by Massey-Harris and Cockshutt Plow in the face of restrictions and uncertainties in other countries.³⁶⁰

Because of currency restrictions it is felt that it is unlikely that sales to soft currency countries will expand much beyond their present level. It is noted, however, that government financing, as under the Colombo Plan, might appreciably affect the volume of overseas sales particularly for a short period. In North America, many of the factors that contributed to the growth of the industry in the past are felt to be not likely to have the same effect in the future, and it is said that there appears to be little question that replacement rather than original sales will form a much greater proportion of the demand for some time to come. The extent to which the demand for farm machinery may fall behind the growth of G.N.P. over the long term cannot be gauged with any accuracy. The disparity, however, could be fairly substantial in spite of the fact that the industry may be expected to increase its actual sales volume. A growth in the Canadian share of the North American market in the postwar period is attributed largely to the production of the self-propelled combine. The Canadian industry may have difficulty in retaining its present share of combined North American production in any future expansion on this continent. The industry in the

³⁵⁹ J. D. Woods and Gordon Limited. *The Canadian Agricultural Machinery Industry*.

³⁶⁰ *Ibid.*, Chap. 2, and Exhibit III.

United States is well located to serve the whole North American market, the possibility of a reimposition of the United States tariff cannot be wholly ignored and there is a tendency to concentrate production in larger or more specialized plants most of which are already located in the United States. It is not expected that the Canadian industry will decline in size, but any broad expansion in Canadian production facilities is said to appear unlikely.³⁶¹

As regards the North American market for agricultural machinery, it may be noted that the Paley Report assumed that there would be no increase in the demand for new agricultural machinery between 1950 and 1975. Output of new farm equipment constituted almost 2% of G.N.P. in 1950, as opposed to a previous average of less than 1%, so that the same absolute level of output would provide in 1975 a ratio between investment in farm equipment and G.N.P. greater than that which had prevailed in the past.³⁶² In this connection, United States Department of Commerce data cited in the Commission's study on the Canadian agricultural machinery industry show that the value of United States production was higher in 1951 and 1952 than in 1950, but that in 1953 it was below the 1950 value.³⁶³

In summary, it would appear that Canada's exports of agricultural machinery cannot be expected to increase at anything like the rate which has occurred between the immediate prewar and the postwar periods. Indeed, there are suggestions that there will be no increase over the next 25 years. Yet it may surely be anticipated that the use of machinery in agriculture will increase, that there will be new innovations and that the Canadian industry will continue to be efficient and will pioneer the introduction of some of the new machinery.³⁶⁴ Thus it would seem reasonable to anticipate that there will be some increase in exports over the next 25 years, although they are unlikely to as much as double the value achieved in 1955.

Canada's domestic exports of *non-agricultural machinery* — household machinery, office machinery and industrial machinery — rose from \$7.6 million in 1928 to \$10.8 million in 1937 and reached a postwar peak of \$47.4 million in 1952. In 1955 these exports aggregated \$35.8 million and in the first 11 months of 1956 were \$42.8 million. Included among the 1955 exports were domestic washing machines and parts valued at \$1.0 million, mining machinery and parts at \$3.3 million, bookkeeping and calculating machines and parts at \$4.7 million, typewriters and parts at \$1.1 million, paper mill and pulp mill machinery and parts at \$0.9 million and power saws and parts

³⁶¹ *Ibid.*, Chap. 5.

³⁶² *Paley Report*, Vol. II, pp. 115 and 116.

³⁶³ J. D. Woods and Gordon Limited, *op. cit.*, Chap. 4, and Exhibit X.

³⁶⁴ See also James S. Duncan, Chairman and President, Massey-Harris-Ferguson Limited, *The Position and Prospects of the Farm Implement Industry in Canada*, Submission to the Royal Commission on Canada's Economic Prospects, January 30, 1956, pp. 11 and 12; and R. B. Bradley, President, International Harvester Company of Canada Limited, *Agricultural Implement Industry*, Presentation to the Royal Commission on Canada's Economic Prospects, Toronto, January 30, 1956, p. 3.

at \$2.1 million. Over half of the value, however, was contained in a miscellaneous item, with a total value of \$19.4 million. As with other manufactures, these exports have shown a substantial change in destination over the past 20 years, including a great increase in the importance of the United States market and a decline in exports to the United Kingdom. In 1937 the United Kingdom took 43% of the total, Australia 14%, and New Zealand 7%. In that year also Brazil accounted for 20% and Mexico for 4%. Exports to the United States, however, were only 2% of total sales outside of Canada. In 1955 the United States took 30% of these exports. Other relatively important markets in that year were Pakistan, Colombia, Mexico and Peru, each of which took about 5% of the total. Venezuela took about 4% and Brazil about 3%. Other than Pakistan, sterling area countries were generally less important, with the United Kingdom taking about 3% of the total.

A substantial proportion of the items covered in this category is considered in the Commission's study on the Canadian industrial machinery industry. According to that study, exports of industrial machinery amounted to \$30.4 million in 1954, while exports of all non-agricultural machinery covered here amounted to \$36.7 million. The study notes that, as a high-cost producer with a small home market, the Canadian manufacturer finds difficulty in competing overseas with countries like the United States, the United Kingdom and Western Germany. Nevertheless, exports of industrial machinery in 1953 and 1954 amounted to about 13% of domestic production, or about the same proportion as in 1935-39. These exports would appear to be all the more significant in view of the fact that in 1953 and 1954 domestic production, including exports, accounted for only 38% of the total Canadian market. As regards exports, it is noted that technical assistance which Canadian firms supplied toward building a large pulp and paper mill in New Zealand enabled Canadian firms to export machinery for use on that project in 1954. Government aid under such schemes as the Colombo Plan has also played a part in obtaining the postwar level of exports. It is reported that firms in the industry have expressed a view that they cannot hope for an increase in their share of world markets without such assistance. Tariffs and exchange and trade restrictions are important barriers to exports and, although it is believed that a well-designed and efficiently produced product of a specialist nature can be sold overseas, export prospects are not regarded as favourable. While the right to sell in overseas markets may be reserved by parent companies or foreign licensors, it is doubted whether this situation is seriously hampering exports at the present time, due to more fundamental difficulties.³⁶⁵

Despite the difficulties of selling abroad, it seems reasonable to anticipate that the future will see some further increase in Canada's exports of non-agricultural machinery. Presumably it will be possible to continue sales of certain items of household and office equipment. Most success, however,

³⁶⁵ Urwick, Currie Limited, *The Canadian Industrial Machinery Industry*.

would seem likely in those fields which Canadians know best, *e.g.*, in pulp and paper mill machinery and mining machinery. In this connection, interest attaches to recent statements that the U.S.S.R. would buy fish processing and packaging equipment and sawmill and logging equipment from Canada.³⁶⁶

Canada's domestic exports of *automobiles, trucks and parts* aggregated \$36 million in 1928 and \$27 million in 1937. In 1943 the shipment of military vehicles raised the figure to \$455 million. Postwar exports have fluctuated widely, rising to a peak of \$111 million in 1952 and falling to \$27 million in 1954. In 1955 these exports aggregated \$40 million, only slightly above the value achieved in 1928 and below the value of \$47 million in 1929. A marked change in the postwar period has been the increase in the export of parts from \$2.9 million or 11% of the total in 1937 to \$20.3 million or 51% of the total in 1955.

Despite the well-known difficulty of exporting to Commonwealth markets, these have remained of dominant importance in Canada's automobile exports. In 1937 exports to Australia, New Zealand, the Union of South Africa, India, the United Kingdom and Malaya accounted for 83% of Canada's export of automobiles, trucks and parts. In 1955, these same countries (including Pakistan) took 85% of total exports. Between the two years, sales to Australia and the Union of South Africa increased in relative importance to 38% and 29% of the total, respectively, while sales to each of the other countries listed decreased not only in relative importance but also in absolute value. In the course of the postwar period, exports to other countries have been significant. Thus, 1952 sales to Venezuela aggregated \$6 million, those to Brazil amounted to \$26 million, those to Belgium-Luxembourg to \$8 million and those to Mexico to \$12 million. In the early postwar years, France, the Netherlands, Argentina and Indonesia also provided important markets. None of these markets, however, has been of much significance since 1953.

Data on the declining relative importance of exports to the Canadian automotive industry are contained in the study of that industry prepared for the Commission. In the latter 1930's automobile exports approximated one-third of production, while exports of commercial vehicles slightly exceeded 40%. Exports of automobiles in 1954 totalled only 2.5% of production, while truck exports represented 5.3%. Although the decline in exports was reversed in 1955, the improvement was insufficient to increase the relative importance of export shipments. If chassis shipped without bodies are included, 1955 exports of passenger cars amounted to 7% of total shipments and exports of trucks and buses to 12%.³⁶⁷

The study anticipates a considerable increase in the production of the Canadian automobile industry but, because of what is stated to be the

³⁶⁶ *The Financial Post*, Toronto, September 8, 1956; and *The Gazette*, Montreal, October 26, 1956.

³⁶⁷ The Sun Life Assurance Company of Canada, *The Canadian Automotive Industry*, Chap. 1.

impossibility of evaluating future trends in either imports or exports of motor vehicles in any precise manner, it is assumed that production and sales will be equal through the forecast period. Although exports showed some improvement in 1955, it is stated to be doubtful whether the principal remaining markets in Australia and South Africa will permit any significant expansion in future years. In fact these markets may well decline both absolutely and relatively as a result of measures taken in those countries to enforce domestic manufacture of motor vehicles. It is felt possible that increased economic aid to Southeast Asia and Africa will stimulate an export market of substantial proportions, particularly for trucks, but competition for all international markets may be expected to be keen and Canadian exporters are generally not well situated with respect to markets outside the Commonwealth.³⁶⁸

Among the submissions to the Commission, the president of Chrysler of Canada noted that his company had under development a programme which involved the shipping to Commonwealth countries of a very substantial number of Canadian built vehicles. In addition, it had finalized a plan to supply specialized component engine parts from its new engine plant to be shipped to the United States for assembly and use there.³⁶⁹ Ford of Canada also indicated its continuing interest in the export market.³⁷⁰ Subsequent press reports have indicated more about Chrysler's plans for the development of export business from Canada. It has been stated that the company will soon begin shipping Plymouths and Dodges (most with right hand drives) to New Zealand, Hong Kong, Jamaica, British Guiana and Singapore. This was stated to be Chrysler's first re-entry into the export market since the war.³⁷¹ There have also been reports of increased exports by American Motors (Canada) Limited and indications that the company is seeking to take over the United States parent company's export operations, at least for shipments to Commonwealth markets.³⁷²

It would seem, however, in view of the self-sufficiency programmes of overseas countries and of the competition from smaller European automobiles, that the prospects for the expansion of Canadian exports of automobiles, trucks and parts are not bright. Indeed maintenance of export at the 1955 level of \$40 million is perhaps an optimistic expectation for the long run.

In the postwar period, Canada developed significant exports of "other vehicles, chiefly of iron". This group includes bicycles and parts; railway cars, coaches and parts; non-farm tractors and parts; motor vehicles, n.o.p.

³⁶⁸ *Ibid.*, Chap. 5.

³⁶⁹ E. C. Row, President and General Manager, Chrysler Corporation of Canada Limited, *Submission to the Royal Commission on Canada's Economic Prospects*, at Toronto, January 31, 1956, p. 14.

³⁷⁰ Ford Motor Company of Canada, Limited, *Submission to the Royal Commission on Canada's Economic Prospects*, Toronto, January 31, 1956, pp. 29-32.

³⁷¹ *The Financial Post*, Toronto, April 14, 1956.

³⁷² *The Financial Post*, Toronto, July 21, 1956.

and parts; and vehicles and parts, n.o.p. Prior to 1949 the group also included farm tractors, which amounted to between \$8 and \$10 million in the years 1949 to 1952. For the group as a whole, exports were valued at less than half a million dollars in 1928 and in each of the years 1937 to 1939. During the war they rose to \$71 million in 1942, and in 1946 they amounted to \$33.8 million, including \$481,000 of tractors of all types. The amount fell to \$3.1 million in 1951, now excluding farm tractors, and in 1955 stood at \$6.6 million.³⁷³ Of the \$33.8 million of exports in 1946, \$26.3 million consisted of railway cars and coaches and parts, and \$6.1 million of vehicles and parts, n.o.p. Belgium-Luxembourg took 59% of the exports of railway cars and coaches and parts, India 25% and the Union of South Africa 14%. The United Kingdom accounted for 93% of the exports of vehicles and parts, n.o.p. Of the \$6.6 million of exports in 1955, 34% consisted of railway cars and coaches and parts, 30% of tractors and parts, 22% of motor vehicles, n.o.p., and parts and 15% of vehicles and parts, n.o.p. Thirty-four per cent of the 1955 exports went to the United States, mostly in the form of tractors and to a less extent, motor vehicles, n.o.p., and parts. Thirty-two per cent went to the Union of South Africa, almost entirely in the form of railway cars, coaches and parts, and accounting for most of the exports of this item. The Federal Republic of Germany took 12.5% of total exports, largely vehicles and parts, n.o.p. and New Zealand took about 7%, almost all in the form of motor vehicles, n.o.p., and parts. Exports to the United Kingdom were negligible, as they had been in every postwar year except 1946.

Referring to the contract carbuilders in the Canadian railway rolling stock industry, National Steel Car has stated that these three companies could produce about twice the likely requirements of Canadian railways. Yet the two big railways have in most years accounted for over 90% of their orders. "Unless sources of supply in low labour rate countries are out of the market we have little chance of obtaining export work."³⁷⁴ For this group of vehicles as a whole, some future exports may be expected, but it is unlikely that they will be able to maintain such values as the \$34 million in 1946 and the \$23 million in 1949.

Canada's exports of *guns, rifles and other firearms* were negligible before the war. In 1946 they were valued at \$4.1 million, going largely to China, but by 1951 they had fallen to \$15,000. In 1954 these exports totalled \$39.5 million, but in 1955 the value dropped to \$4.1 million, and in the first ten months of 1956 they were down to \$623,000. Almost all of these exports in the period 1952 to 1955 went to the United States, although sales to Israel accounted for \$1.0 million in 1952 and for \$748,000 in 1954 and \$654,000 in 1955. The relatively small sales in the first ten months of 1956 went

³⁷³ Between the first eleven months of 1955 and the same period in 1956, these exports fell from \$6.2 million to \$3.7 million.

³⁷⁴ National Steel Car Corporation, Limited, *Rolling Stock Industry—Contract Car Builders' Division*, a Submission to the Royal Commission on Canada's Economic Prospects.

largely to Belgium. The future of these exports is exceedingly difficult to anticipate. In a world of continued tension, they may be substantial but it is probable that they will be subject to considerable year-to-year variation.

Exports of *railway track material of iron*, not including steel rails, were not shown separately in the export statistics in the prewar period. In 1948 they were valued at \$1.5 million, of which 51% went to the Union of South Africa, 26% to China and 20% to India. In 1949 the figure was \$420,000 almost entirely to India, and subsequently it declined to a few thousand dollars. In 1955, however, exports jumped to \$3.6 million, almost entirely to Mexico, and presumably associated with the export of steel rails noted in Section 25. If Canada continues to export steel rails, she will presumably continue to export other railway track material. As with primary iron and steel, continued exports are expected but they will presumably be subject to considerable fluctuation.

The D.B.S. export group *iron and its products* contains a number of other items: tubes, pipe and fittings; wire; chains; hardware and cutlery; stamped and coated products; tools; cooking and heating apparatus; and numerous other items. This group of items has long been of some significance in Canada's export picture, but exports in recent years show only a very modest increase above prewar values, an increase considerably less than the rise in prices. In 1928 exports amounted to \$7.0 million and in 1937 they were valued at \$9.4 million (including railway track material of iron). The postwar peak was \$19.4 million, established in 1951. Since 1952, however, exports have been lower. In 1955 they amounted to \$10.9 million but, between the first ten months of 1955 and the same period of 1956, they rose by \$4.7 million. As with so many manufactured goods, Commonwealth markets dominated the export picture in the prewar period. In 1937, 29% went to the United Kingdom, 22% to the Union of South Africa, 14% to Australia and 11% to New Zealand. In 1955 the four Commonwealth markets, which in 1937 had accounted for 76% of exports, accounted for only 21% of total sales. Only to New Zealand had the dollar value of sales been maintained. Exports to the United States, however, aggregated 33% of the total in comparison to 4% in 1937. In addition, a number of other markets developed. Thus sales to Venezuela in 1955 were larger than those to the United Kingdom or Australia and almost as large as those to the Union of South Africa.

Canada should be able to continue to export these miscellaneous commodities and, indeed, to increase her exports. Despite tariff advantages, substantial recovery of Commonwealth markets is not to be expected, although an easing of restrictions might facilitate some increase in sales. The United States will probably continue to be a major market for various miscellaneous items and markets in underdeveloped countries should be of significance, particularly before programmes envisaging the fabrication of iron and steel products have reached fruition.

In no year from 1926 to 1940 did Canada's export of *ships and vessels* aggregate as much as \$1 million. In 1942, however, they totalled \$107 million and in 1948 they amounted to \$84 million. Of the 1948 exports, 72% went to France, 10% to Brazil and 7% to China. Over 96 per cent of these exports were in the item "ships sold to other countries". Subsequent exports of ships and vessels have been substantially below the 1948 value, falling in 1955 to \$6.3 million. Of this amount, 37% went to Liberia, 32% to the United States, 12% each to Sweden and Costa Rica and 5% to Panama. Of the total, 66% consisted of ships sold to other countries and included all the sales to Liberia, Sweden, Costa Rica and Panama. The United States accounted for most of the exports of boats, canoes and parts (22% of the group total) and gasoline launches and pleasure yachts (10%). Material for the equipment and repair of ships made up the remaining 2% of the group.

For the future, Canada cannot be expected to compete favourably with the United Kingdom, Germany, Japan and other lower cost shipbuilders, although, in periods of intense activity in shipbuilding and under special situations, foreign orders may be given to Canadian shipyards. On the other hand, it seems reasonable to expect that Canada will be able to export increasing numbers of pleasure craft and smaller boats constructed for special purposes. Activity on Canada's coastal and inland waters should mean that Canadian boatbuilders develop particular skills in the construction of such craft and it may be that their increasing export will lift the category of ships and vessels above the \$6.3 million to which exports had fallen in 1955.

The only year from 1926 to 1939 when Canada's domestic exports of *aircraft and parts* were significant was in 1938 when total shipments were valued at \$2.8 million, of which 68% went to Turkey and 21% to Hong Kong. During the war these exports rose to a \$107 million in 1944 and \$108 million in 1945. They fell to \$4.4 million in 1950 but were up again to over \$40 million in 1953. In 1955 these exports were valued at \$19.9 million, but in the first ten months of 1956 they reached a value of \$44.6 million. While different markets have from time to time been of importance, since 1950 the United States has taken the bulk of these exports. In the first ten months of 1956, 55% of total exports went to the United States, 31% to the Union of South Africa and 6% to Colombia. Aircraft, as opposed to parts, accounted for 55% of the total. That exports will continue high is indicated by the announcement that Canadair Limited had received an order for Sabre jet aircraft worth more than \$75 million from the Federal Republic of Germany.³⁷⁵

Briefs presented to the Commission by Canadair Limited and A. V. Roe Canada Limited stated that future developments would be, to a very large extent, dependent on military requirements.³⁷⁶ Both indicated that Canada

³⁷⁵ *The Gazette*, Montreal, December 20, 1956; and *The Financial Post*, Toronto, December 22, 1956.

³⁷⁶ J. Geoffrey Notman, President and General Manager, Canadair Limited, *Statement on Canada's Aircraft Industry to Royal Commission on Canada's Economic Prospects*, January 20, 1956, p. 26; and Crawford Gordon, Jr., President and General Manager, A. V. Roe Canada Limited, *The Next 25 Years in Canadian Aviation*, a Brief on the probable developments of the aviation industry in Canada and their effect on the Canadian economy, prepared for the Royal Commission on Canada's Economic Prospects, p. 11.

could maintain an efficient aviation industry. The Avro Brief stated that Canadian costs were generally lower than those in the United States, despite lower Canadian production runs, but were slightly higher than in Britain due to Britain's much lower labour rates.³⁷⁷ In the Canadair Brief the belief was expressed that, as the Canadian aircraft industry developed, it not only would be capable of taking care of Canada's requirements both military and civil, but through export could also contribute to the military and civil requirements of the free world.³⁷⁸ The Avro Brief recognized that exports to other countries were largely affected by national policies and resulting trade regulations, but stated that the country able to develop and produce designs technically and economically superior to others would, as in the past, overcome these barriers. Examples cited were the de Havilland light transports, the Otter and the Beaver, both designed and produced in Canada. These were sold in 40 other countries simply because they were the best in their field.³⁷⁹

The future of Canada's exports of aircraft and parts is dependent not only upon the technical success achieved by the Canadian industry but also upon future international political developments. Canadian manufacturers should be able to continue to export civil aircraft, particularly of designs developed to fit Canadian conditions but which may find uses in other countries. It is also possible that Canadian manufacturers may co-operate with those in other countries in the development of large commercial aircraft.³⁸⁰ In considerable measure, however, future Canadian exports would appear to be tied to the military needs of importing countries. Co-operation with the United States defence effort and sales of military aircraft to other countries are likely to provide the largest part of the market. In these circumstances, prediction of the value of sales of aircraft and parts is exceedingly difficult. Nevertheless, in the sort of world which is likely to exist, it would appear that Canada's exports could be substantial, although, as with many other commodities considered in this section, they may well be subject to considerable year-to-year variation.

Canada's exports of *cartridges for guns, rifles and other firearms* grew from \$154,000 in 1937 to \$801,000 in 1939. In these years most of these sales went to the United Kingdom. In 1949 exports amounted to \$13.7 million, almost entirely to Pakistan, China and the Netherlands. They fell to \$2.4 million in 1951, but rose to \$19.9 million in 1953. In 1955, however, they were down to \$3.6 million and, in the first ten months of 1956, to \$212,000. In 1953, 1954 and 1955, these exports have gone very largely to the United States, although

³⁷⁷ Crawford Gordon, Jr., *op. cit.*, p. 21.

³⁷⁸ J. Geoffrey Notman, *op. cit.*, pp. 26 and 20.

³⁷⁹ Crawford Gordon, Jr., *op. cit.*, p. 27.

³⁸⁰ See, for example, the suggested co-operation between Canadair, Bristol, and Convair in the production of a large turbo-prop passenger airplane. The status of this project, however, appears to be uncertain. (See *The Gazette*, Montreal, November 10, 1955; and *The Financial Post*, Toronto, November 12, 1955, and March 3, 1956.)

in 1953 purchases by Pakistan amounted to \$4.6 million and those by India to \$715,000. To some extent, these exports may be expected to move with those of guns, rifles and other firearms.

Summarizing the expectations for the sundry manufactures considered in this section, it is projected that exports will approximately double, from \$353 million in 1955 to \$700 million in 1980. This, however, is an increase of only 42% above the level achieved in 1952, and is below the "potential level" of \$719 million arrived at by adding the highest postwar value achieved in each category. On the other hand, the increase projected for the period 1955 to 1980 would appear to be greater than the volume increase between 1928 or 1937 and 1955. It is further suggested that the United States will continue to be the most important market for these exports, but that it may lose some ground relatively to overseas markets other than the United Kingdom.

The figure of \$700 million for 1980 has been arrived at by the summation of possible export values for each of the 15 items considered in this section. In many cases, however, very little confidence is felt in the particular values ascribed to the different items. These are subject to many uncertainties and will undoubtedly exhibit substantial year-to-year fluctuation. For the group as a whole, however, as long as Canada can maintain her position at or near the forefront of industrial development and, particularly, as long as she can remain close behind the United States, an increase in exports of manufactured goods would appear to be in prospect. To some extent, the fact that many Canadian manufacturing firms are subsidiaries of United States producers may inhibit their entry into export markets. On the other hand, there is some tendency for large United States companies to concentrate in Canada the production of certain items which are relatively more popular in this country than in the United States. With scale rising in the United States and flexibility declining, remaining United States demand for such items may be supplied from Canada in cases where entry into that market is relatively free. Where overseas purchasers prefer the Canadian-type product, their demands may be filled from Canada rather than from the United States.

Underdeveloped countries should be significant purchasers of Canada's manufactured exports, and a high level of activity in the United States should mean that that country constitutes an important, although variable, market for Canadian manufactured output. In these circumstances about a doubling of the 1955 level would appear to be reasonable. A higher rate of increase, for example, one parallel to the expected growth of secondary manufacturing in Canada, would not appear to be likely. Competition from the more developed industrial areas such as the United States, the United Kingdom, Germany and Japan, together with the restriction which will almost certainly inhibit trade in manufactures in the future, would seem to make such rapid rates of growth in exports quite out of the question.

30. Other Commercial Exports

The remaining items of a commercial character, included among Canada's domestic merchandise exports, are as listed in the following table.

Canada's Domestic "Other Commercial" Exports
(thousands of Canadian dollars)

	1954	1955
Toys and sporting goods.....	582	959
Brushes.....	370	296
Packages of all kinds, n.o.p.....	2,186	3,612
Pens, pencils and parts.....	1,381	1,106
Refrigerators and parts.....	288	529
Other household and personal equipment.....	620	613
Musical instruments.....	604	622
Films.....	3,750	3,698
Other scientific and educational equipment....	1,328	1,809
Electrical energy	7,422	10,616
Contractors' outfits.....	—	1,771
Other.....	1,445	1,797
Total.....	19,976	27,428

Much the most important item among these exports is electrical energy, exports of which were valued at \$7.4 million in 1954, \$10.6 million in 1955 and \$13.4 million in the first 11 months of 1956. A small amount of these exports go to Alaska and the balance to the United States. Next in importance are films at about \$3.7 million in 1954 and in 1955, followed by unidentified packages, valued at \$2.2 million in 1954 and \$3.6 million in 1955. The remaining items consists largely of miscellaneous manufactured goods.

In the late 1920's, Canada's exports of electrical energy amounted to about 1.5 billion k.w.h. per year with values between \$4 and \$5 million. By 1937-39 the volume of exports had risen to an average of 1.85 billion k.w.h. a year with an average value of \$4.2 million. The volume and the price of exports fluctuated in the postwar period, but both volume and total value rose to peaks of 4.0 billion k.w.h. and \$10.6 million in 1955. In the first ten months of 1956, the average value rose, so that exports of 3.8 billion k.w.h. were valued at \$11.5 million.

In the Commission's energy study it is noted that a declining proportion of Canada's production of electricity has been exported. For the future it is projected that net exports in 1980 will be 10 billion k.w.h., although a change in national policy might considerably increase this figure.³⁸¹

If 10 billion k.w.h. is taken as the forecast for minimum net exports of electricity in 1980, there remain the questions of the volume of gross exports and of the export price. In 1955, net exports were 3.9 billion k.w.h. and gross

³⁸¹ John Davis, *Canadian Energy Prospects*, Chap. 4, sixth section.

exports 4.0 billion k.w.h. For the future, both imports and gross exports will presumably increase but not necessarily at the same rates. The average value of gross exports has fluctuated widely over recent years, dropping from \$3.50 per thousand k.w.h. in 1953 to \$2.64 in 1955, and rising to \$3.01 in the first ten months of 1956. If a value of \$3 per thousand k.w.h. were taken, 10 billion k.w.h. would have a total value of \$30 million. To allow for gross exports in excess of the net amount and for the anticipated increase in price, it is here suggested that the 1980 export value will be in the neighbourhood of \$50 million.³⁸²

The projection of the remaining items considered in this section is exceedingly difficult. In 1955 these exports were valued at \$17 million and, although little basis for projection exists, it is perhaps reasonable to suggest that they might about double in value between 1955 and 1980. Accordingly, a figure of \$75 million is employed for the group as a whole, although this involves some rounding down and could readily prove too small under policies on the export of electricity other than those assumed.

31. *Non-commercial Items*

Two items of a non-commercial character remain in Canada's domestic merchandise exports. These are settlers' effects, valued at \$17.3 million in 1954 and \$21.9 million in 1955, and donations and gifts, valued at \$3.8 million in 1954 and \$1.5 million in 1955. The total value was thus \$21 million in 1954 and \$23 million in 1955. While the items contribute to the total of merchandise exports as published in *Trade of Canada*, they do not result in the earning of foreign exchange for Canada. Thus, as indicated in Chapter 1 of Part A, they are deducted from the total of merchandise exports in adjusting the trade figures to prepare the balance of payments and the national accounts.³⁸³ In the last analysis, the purpose of the present exercise is to reach a figure which is appropriate for balance of payments and national accounts purposes. The particular amount chosen for non-commercial items in 1980 is of little relevance, since whatever figure is added here will be subtracted in the balance of payments adjustment. For the sake of completeness only, therefore, non-commercial items are projected as rising from \$23 million in 1955 to \$75 million in 1980.

32. *New Gold Production Available for Export*

Movements of gold in primary or semi-fabricated state are excluded from the statistics of Canada's merchandise exports. Since the beginning of

³⁸² Gross exports associated with a net movement of 10 billion k.w.h. might imply even larger gross exports than are incorporated in this calculation. For at least part of the movement, however, it seems preferable to deal with net exports because of the nature of the interchange.

³⁸³ In 1954 only \$2.7 million of the \$3.8 million of the private donations was deducted in the balance of payments adjustment. In 1955, however, the whole amount was deducted and it is not felt that this refinement is significant for present purposes.

The monthly *Trade of Canada* leaflet "Domestic Exports" shows "donations and gifts" and "non-commercial articles". For some periods, the latter item exceeds "settlers' effects". It is "settlers' effects", however, which is deducted in the balance of payments adjustment.

1952, the standard of exclusion has been that suggested by the International Monetary Fund and the United Nations Statistical Office — all gold and gold products in which the value of gold is 80% or more of the total value. The only exception to this is “jewellers’ sweepings”, where the gold content cannot readily be separated from the other metals.³⁸⁴ On the other hand, gold is produced in Canada primarily as an export commodity. Whether or not the gold produced is physically exported or placed under earmark in Canada for foreign holders, that part of it which does not enter into domestic fabrication or hoards is available for international payments or to increase Canada’s international exchange reserves. This available local production, while it need not be physically exported, has the economic effects of an export. As noted in Chapter 1 of Part A, it is sometimes desirable to include this gold in arriving at the total value of the export of goods.

The D.B.S. publishes data on new gold production available for export, formerly called “net exports of non-monetary gold”. Basically, the series is the equivalent of gold production in Canada, exclusive of gold held by producers before the refining stage and gold consumed by industry or the arts in Canada. In addition to the amount sold by the Mint to the Exchange Fund, it includes a small amount exported in the form of concentrates for refining in the United States. Since November 1, 1951, it has also included sales abroad of commercial gold by producers and, accordingly, has also excluded increases in stocks at the Mint in safekeeping for the mines. It was stated in Vol. I of the 1954 issue of *Trade of Canada* that, in practice, most gold produced in Canada became available for export or for use in Canada’s official reserves, as normally only a minor part was consumed by Canadian industry (some 3% in the postwar years). In March 1956, the possibility of gold disappearing into private holdings was created, when the Minister of Finance in his budget speech announced that Canadians and foreigners could henceforth buy and sell gold freely in Canada and export it without government permit. Limiting the effect of this, Canadian mines which elected to sell on this free market would no longer be eligible for assistance under the Emergency Gold Mining Assistance Act. Such sales are included in the figures for new gold production available for export.

Canada’s new gold production available for export is valued on the basis of the Canadian dollar equivalent of the United States price for gold. Since January 31, 1934, this price has been US\$ 35 per fine troy ounce. The Canadian price departs from \$35 per ounce as the exchange rate between the Canadian and United States dollars departs from parity. Thus, it rose above \$35 during the war and from 1949 to 1951, since when it has been below \$35. At the old price of US\$ 20.67 per ounce, new gold production available for export rose from \$30 million in 1926 to \$82 million in 1933. Under the stimulus of the increase in price and later of the encouragement given to gold mining as a source of badly needed United States dollars in the early years

³⁸⁴ See Section 20.

of the war, the figure rose from \$114 million in 1934 to \$204 million in 1941. At the end of the war, however, the value of gold production available for export was down to \$96 million in each of the years 1945 and 1946. In both 1954 and 1955 it was \$155 million and in the first nine months of 1956 it was almost identical with the same period in 1955. The rise to the postwar high in volume in 1954 was accomplished despite the general increase in costs relative to the selling price. Since 1948, however, the Canadian industry has benefited from assistance payments, under the Emergency Gold Mining Assistance Act, varying between \$9.0 million in 1950 and \$15.6 million in 1954.³⁸⁵

Gold production in Canada first exceeded one million fine ounces in 1922. In 1930 it rose above two million ounces, in 1932 above three million ounces and in 1937 above four million ounces. It reached its peak of 5,345,000 ounces in 1941 and then declined to 2.7 million ounces in 1945. Subsequently, it rose to 4,542,000 ounces in 1955 and dropped back to 4,379,000 ounces in 1956. Gold is produced in Canada in lode mines and from placer deposits which, as they produce mainly gold, may be referred to as straight gold mines. In 1955, 87% of Canada's gold production came from these straight gold mines, while the remaining 13% was a by-product from base metal mines, particularly those producing copper.³⁸⁶

According to the Annual Report of the American Bureau of Metal Statistics, the Union of South Africa produced 36% of the world total in 1953, the U.S.S.R. an estimated 27%, and Canada 12%. Next in importance was the United States with 6%. Data published by the International Monetary Fund indicate that world production, outside the U.S.S.R., China, Bulgaria, Czechoslovakia, Hungary, Rumania and North Korea, increased by an estimated 21% between 1948 and 1955. Of the 1955 total accounted for by these countries, 54% came from the Union of South Africa, 17% from Canada and 7% from United States. Since 1948, production in the Union of South Africa and Canada increased significantly while that in the United States declined slightly.³⁸⁷

The recent study by the United States Bureau of Mines noted that normally 90% to 95% of the gold production of the world was used for monetary purposes by governments and central banks. The remaining 5% to 10% was consumed by the arts, science and industry. During the past several years, however, an abnormally large quantity had found its way into private

³⁸⁵ D.B.S., *The Gold Mining Industry, 1954*, p. 13.

During the House of Commons consideration of the extension of the Act for the years 1957 and 1958, the Minister of Mines and Technical Surveys stated that the total cost for 1954 was expected to be about \$16.3 million, but that for 1955 it was expected to be in the neighbourhood of \$9.3 million. For 1956 the anticipated figure was \$8.9 million, and for 1957 \$8.6 million. (*House of Commons Debates, Official Report*, Monday, June 11, 1956, pp. 4911 and 4912.)

³⁸⁶ D.B.S., *The Gold Mining Industry, 1954*; *Gold Production*, October, 1956; and *Preliminary Estimate of Canada's Mineral Production, 1956*.

³⁸⁷ D.B.S., *The Gold Mining Industry, 1954*; and International Monetary Fund, *International Financial Statistics*, July 1956.

hoards and it was felt probable that such hoarding would continue for some years to come. Net consumption of gold in the arts and industry in the United States had considerably exceeded the output of domestic mines in recent years.³⁸⁸

Data on world (minable) gold reserves were said to be incomplete and of limited meaning because of uncertainties in the price-cost relationships of the future. Nevertheless, a total recoverable reserve of one billion ounces did not seem to be out of reason, provided there was enough incentive to mine it. Half of this reserve was in the Union of South Africa. The short-term outlook was for somewhat greater world production, as growing output from the new gold districts in the Orange Free State and the Transvaal was added to the yield of older fields. The long-term outlook depended on greater returns to the gold mining industry to offset rising costs. In the United States, straight gold mining operations appeared headed for progressively more difficult times unless relief in some form could be brought about. The output of by-product gold would vary with the fortunes of the metals with which it was associated and would be only mildly affected by the factors that determined the output of straight gold mines.³⁸⁹

In June 1956, the Minister of Mines and Technical Surveys noted in the House of Commons that it had been estimated by officers of his department that, if payments under the Emergency Gold Mining Assistance Act were discontinued at the end of 1956, 18 or 20 mines with an annual production of about 700,000 ounces of gold would quite likely close after a two- or three-year salvage period. At the same time, the Minister noted that the anticipated decrease of payments under the Act was due to the fact that several mines were currently mining better grade ores and therefore would receive less help. There had been a marked improvement in efficiency in the last few years and he predicted that the trend toward lower payments under the Act would continue.³⁹⁰

In the Commission's mineral study it is stated that, if the present fixed price and a continuance of the present scale of cost-aid is assumed, together with a gradual increase in costs, it is likely that by 1980 the production of gold by straight gold mines will be about two-thirds of that at the present time. On the other hand, the amount of by-product gold will probably increase considerably. Most copper mines are large-scale, long-lived operations and their production of gold is little influenced by the price of gold. Thus, a continuation of present governmental policy would suggest that the outlook is for a 20% to 25% decline in Canada's total output of gold over the next 25 years.

³⁸⁸ U.S. Department of the Interior, Bureau of Mines, *op. cit.*, pp. 316 and 320.

³⁸⁹ *Ibid.*, pp. 320 and 325.

³⁹⁰ *House of Commons Debates, Official Report*, Monday, June 11, 1956, pp. 4911 and 4912.

If it is assumed that new gold production available for export will vary with total gold production in Canada, a decline in production of 20% to 25% would mean that the value of the former at present prices would fall from \$155 million in 1954 and 1955 to \$116 million to \$124 million in 1980. It would appear to be necessary to assume that the United States Treasury will not change its price of gold nor its purchase policy, as long as periods of relative prosperity continue. Further, experience of the last few years would seem to prove that demand in a free market cannot create premiums much above the United States Treasury price, if significant amounts of new production are allowed to flow into the free market. It therefore seems desirable to assume that the present United States dollar price will rule over the next 25 years. Assuming that the exchange rate between the Canadian and United States dollars will be at about parity and that government assistance to Canadian gold mines will continue at about present rates, it is projected that the value of new gold production available for export will amount to about \$125 million in 1980 — recognizing, however, that a higher price, if it should come, would mean larger volumes as well as higher average value.

33. *Re-exports*

The final element in Canada's exports of goods consists of re-exports or exports of foreign produce — imports entered for consumption which are later exported from Canada in the same condition as when imported. It was noted in Chapter 1 of Part A that, in some circumstances, as when total exports are compared with total imports, it is desirable to add re-exports to domestic exports in order to arrive at a figure for total merchandise exports or total exports of goods.

In 1928 re-exports amounted to \$24.4 million or 1.8% of domestic exports; in 1937 they were \$14.8 million or 1.5%. In 1954 and 1955 they were \$65.6 million and \$69.5 million or 1.7% and 1.6%, respectively, of domestic exports. Since the end of the First World War, the bulk of Canadian re-exports have gone to the United States. In 1955 the United States accounted for 76%, the United Kingdom for 7%, other Commonwealth countries for 2%, and the rest of the world for 15%. The nature of 1955 re-exports is indicated by the following table.

Exports of Foreign Produce from Canada, 1955

(thousands of Canadian dollars)

Agricultural food products.....	2,892
Agricultural non-food products.....	864
Sausage casings.....	1,693
Other animals and animal products.....	1,983
Fibres, textiles and products.....	2,764
Wood, wood products and paper.....	989
Internal combustion engines and parts.....	3,202

Exports of Foreign Produce from Canada, 1955 — (Continued)
(thousands of Canadian dollars)

Mining machinery and parts.....	2,129
Machinery and parts, n.o.p.....	4,314
Automobile parts.....	4,352
Tractors, n.o.p., and parts.....	1,525
Motor vehicles, n.o.p., and parts.....	2,098
Vehicles and parts, n.o.p.....	1,649
Other iron and its products.....	9,991
Non-ferrous metals and products (a).....	5,886
Industrial diamonds and dust or bort.....	4,628
Other non-metallic minerals.....	5,041
Chemicals and allied products.....	2,075
Packages of all kinds, n.o.p.....	1,600
Ships sold to other countries.....	3,470
Aircraft parts.....	1,793
All other.....	4,561
Total.....	69,499

a) Includes electrical apparatus.

Of the 1955 total, 27% consisted of transportation equipment, including all engines; 19% of agricultural and other machinery; and 5% of electrical apparatus.

Published data do not provide the basis for an analysis of the significance of Canada's re-exports. The nature of the commodities, however, suggests that they may include the removal of machinery and equipment which came into Canada to perform a specific task or to work during a particular season of the year. As such goods would have cleared Canadian customs on entry, they would show up as re-exports when they left the country. In addition, it is understood that a significant portion of total re-exports consists of returned imports — goods which entered the country through customs but which, for one reason or another, were returned to the sender. Some re-exports, however, are more closely related to normal export trade. Some Canadian firms, supplying goods to overseas customers, include in these supplies foreign goods which they import into Canada for the purpose. Similarly, imported ships may be exported after their period of service in Canada has ended. Re-exports of such items as industrial diamonds and furs are related to the existence of a market for these commodities in Canada. In general, however, trade of an *entrepôt* character accounts for a relatively small amount of Canadian re-exports, although more existed before Newfoundland became part of Canada and, to a less extent, when fewer restrictions attached to trade with the West Indies. Finally, it may be noted that a part of the re-export trade is of a non-recurring or highly variable nature, as, for example, the sale of war assets which had previously been imported and the sale of used ships.

In the absence of much basis on which to forecast Canada's re-exports, a purely mechanical projection is suggested. The volume of re-exports appears to be governed, in considerable part, by the same forces that cause exports of Canadian produce to go out of the country and cause goods to be imported into Canada, with the latter probably more important. The projections set forth in Sections 1 to 31 of this chapter imply an aggregate increase of 142% in the value of Canada's domestic merchandise exports, excluding gold, for the period 1955 to 1980. In the Commission's study of imports, it is suggested that, over the same period, merchandise imports will increase by about 133%.³⁹¹ If these percentage increases are applied to re-exports, their value would be increased from \$69.5 million in 1955 to \$168 million or \$162 million. Accordingly, a 1980 projection for re-exports of \$175 million is offered.

34. *Total Exports of Goods*

The significance of the export projections offered in the preceding sections is examined in Chapter 4 of Part A of this study. Here it may be noted that the projections add up to the total shown in the following table.

The projections for domestic merchandise exports, excluding gold, add up to a 1980 value of almost \$10.4 billion or 142% above the 1955 value. Taking into account the projections for new gold production available for export and for re-exports, the total is increased to nearly \$10.7 billion or 137% above the 1955 value. In Chapter 4 of Part A a balance of payments

Exports of Goods: 1954, 1955 and Projection for 1980

(millions of Canadian dollars)

	1954	1955	1980
Total domestic exports (excl. gold) . . .	3,881	4,282	10,375
New gold production available for export	155	155	125
Re-exports	66	69	175
Total exports of goods (incl. gold)	4,102	4,506	10,675

adjustment is made by subtracting the \$75 million projected for non-commercial items, and likely developments in the other current receipts in the balance of payments are examined briefly. For reasons developed in that chapter, it is suggested that a further upward adjustment, falling largely on merchandise exports, appears necessary to arrive at the final forecast for Canada's exports in 1980.

³⁹¹ David W. Slater, *Canada's Imports*.

ALTERNATIVE MEASUREMENTS OF CANADA'S EXPORTS

	1928	1932	1937	1954	1955
		(millions of Canadian dollars)			
Domestic merchandise exports					
D.B.S. data in <i>Trade in Canada</i>	1,339	490	997	3,881	4,282
Possible adjustments					
— inclusion of inland freight (a)	+ 48	+ 18	+ 39	+ 167	+ 205
— inclusion of defence equipment or supplies				+ 202	+ 166
— basing wheat exports on Bd. of Grain Commissioners' data			+ 33	(- 3)	(- 1)
— treating Newfoundland as part of Canada (b)	+ 21	+ 18	+ 19		
D.B.S. data, adjusted for wheat (c)	1,339	490	1,030	3,881	4,282
Gold production available for export	40	70	145	155	155
Domestic exports of goods, including gold (adjusted for wheat) (c)	1,380	560	1,176	4,036	4,437
Re-exports	24	8	15	66	69
Total exports of goods, including gold (adjusted for wheat) (c)	1,404	568	1,190	4,102	4,506
Merchandise exports in the balance of payments	1,341	495	1,041	3,929	4,332
Exports of goods, including gold, in the balance of payments	1,381	565	1,186	4,084	4,487
Exports of goods and services — in the balance of payments	1,788	808	1,593	5,236	5,839
— in the national accounts	1,773	804	1,591	5,147	5,753
			(1948 = 100)		
Index of export value	44	16	32	126	139
Index of export prices	65	40	53	115	118
Index of export volume	66	40	61	110	118

(a) Estimates, relating to total merchandise trade, including re-exports.

(b) Approximation by using average of Newfoundland's domestic exports for the two years ended June 30 which include the year in question, less Canada's imports from and exports to Newfoundland for the calendar year. Canadian import data are used rather than the larger Newfoundland data on exports (including re-exports) to Canada in an effort to eliminate some of the re-exports.

(c) The adjustment for wheat is made only for 1937.

Sources: D.B.S., *Trade of Canada; The Canadian Balance of International Payments; National Accounts, Income and Expenditure; Review of Foreign Trade, First Half Year, 1954; Canadian Statistical Review*, June 1956, and unpublished information; Bank of Canada, *Statistical Summary, 1950 Supplement*, and *Financial Supplement, 1954*, and unpublished information; Newfoundland Government, *Customs Returns for the Fiscal Year Ended March 31, 1958*. See also Appendix D.

Appendix B

CANADA'S BALANCE OF INTERNATIONAL PAYMENTS, 1955

(millions of Canadian dollars)

	With all countries		With the U.S.	
	Credits (receipts)	Debits (paym'ts)	Credits (receipts)	Debits (paym'ts)
Current Account				
Merchandise trade (adjusted).....	4,332	4,540	2,598	3,280
Mutual Aid to NATO countries.....	222	222		
Gold production available for export..	155		155	
Travel expenditures.....	328	449	303	363
Interest and dividends.....	160	477	82	393
Freight and shipping.....	385	408	199	287
Inheritances and migrants' funds.....	86	101	45	78
Official contributions.....		24		
All other current.....	393	532	314	336
Total current account.....	6,061	6,753	3,696	4,737
Current account balance (deficit).....		692		1,041
Capital Account				
Direct investment.....	410	67	306	54
Canadian securities:				
trade in outstanding issues (net).....		17		62
new issues and retirements.....	166	184	127	169
Foreign securities:				
trade in outstanding issues (net).....	16		27	
new issues and retirements.....	17	48	2	8
Repayment of postwar Gov't of Canada loans.....	39			
Repayment of Gov't of Canada war loans.....	30			
Changes in Cdn. dollar holdings of foreigners (net).....	89		66	
Changes in official Canadian holdings of gold and foreign exchange (net decrease).....	44		42	
Other capital movements (net).....	197		128	
Net capital movement (inflow).....	692		405	
Balance settled by exchange transfers from overseas.....			636	
Total financing of current account balance.....	692		1,041	

SOURCE: D.B.S., *The Canadian Balance of International Payments, 1955, and International Investment Position*, pp. 34-35. Data are subject to revision.

COMMODITY DISTRIBUTION OF CANADA'S EXPORTS

THE FOLLOWING table is based in the main on data published by the D.B.S. in *Trade of Canada*. Changes in classification from that presented by the Bureau are explained in footnotes. For the period August 1936 to the end of 1939 and for 1946, data for wheat are based upon figures issued by the Board of Grain Commissioners as explained in Appendix D. Totals have been adjusted to reflect the use of these data. Figures for new gold production available for export were obtained from *Trade of Canada* for the period from 1936. For earlier years, they are available in millions of dollars in the Bureau's *The Canadian Balance of International Payments, 1926 to 1948*, but, in calculating the final totals in the table, figures to one place of decimals supplied by the Bank of Canada were employed.

COMMODITY DISTRIBUTION OF CANADA'S EXPORTS
(millions of Canadian dollars)

	Wheat and flour (a)	Barley, oats and rye	Other agric. and vegetable products (b)	Live animals and meats (c)	Fish and fishery products	Other animal products	Fibres (excl. synthetics)	Planks and boards
1926	435	38	66	50	36	82	1	62
1927	400	39	53	47	34	84	3	57
1928	498	48	47	38	36	90	3	48
1929	302	19	48	32	36	73	2	49
1930	223	3	43	12	31	48	1	37
1931	138	15	31	8	25	37	1	20
1932	146	14	27	9	18	28	0	13
1933	142	4	36	15	20	32	2	17
1934	150	12	37	26	22	33	1	26
1935	156	10	40	32	24	40	1	26
1936	237	20	44	48	25	51	2	37
1937	181	12	47	60	28	55	2	45
1938	101	12	48	45	27	45	1	36
1939	101	14	58	53	29	49	1	49
1946	415	41	102	152	87	120	4	125
1947	462	46	115	123	82	126	2	208
1948	368	72	141	221	85	129	3	196
1949	533	61	120	137	94	108	2	160
1950	420	51	111	159	113	94	3	291
1951	555	125	129	138	117	93	3	312
1952	737	231	142	54	113	70	2	296
1953	670	227	125	69	111	71	2	282
1954	463	131	136	72	130	68	2	325
1955	413	99	167	57	125	82	1	385

Commodity Distribution of Canada's Exports (Cont'd)

	Newsprint	Wood pulp	Other forest products	Asbestos and products	Petroleum and products	Other non-metallic minerals and products	Aluminum and products	Copper and products
1926	114	52	58	11	2	14	7	15
1927	123	47	54	11	2	15	11	15
1928	141	46	55	11	2	13	9	24
1929	149	44	51	13	3	14	15	37
1930	133	39	41	9	2	12	10	31
1931	107	30	28	5	2	8	4	17
1932	83	19	19	3	1	5	4	16
1933	69	23	21	5	2	6	6	17
1934	83	25	27	5	1	9	8	23
1935	88	28	34	7	1	10	11	30
1936	104	31	38	10	1	12	11	37
1937	126	42	49	15	1	15	19	56
1938	105	28	43	13	1	11	24	53
1939	116	31	47	16	1	13	26	53
1946	266	114	120	24	5	28	56	37
1947	342	178	158	33	7	35	64	59
1948	383	212	163	42	9	44	102	79
1949	434	171	110	37	3	34	94	87
1950	486	209	128	63	0	40	107	88
1951	536	365	185	82	2	48	125	87
1952	592	292	187	88	9	47	162	119
1953	619	249	146	85	7	56	178	125
1954	636	271	147	84	9	53	185	135
1955	666	297	172	98	40	69	213	175

Commodity Distribution of Canada's Exports (Cont'd)

	Lead and products	Nickel	Precious metals (excl. gold)	Zinc and products	Other non- ferrous metals and products (d)	Iron ore	Primary iron and steel (e)	Fertilizers
1926	14	12	14	9	2	0	7	5
1927	13	15	12	8	3	0	6	5
1928	11	22	13	8	4	0	5	5
1929	11	26	12	9	5	0	8	7
1930	8	21	12	6	3	0	5	6
1931	5	14	7	6	2	0	2	2
1932	3	7	6	4	2	0	1	3
1933	5	23	7	5	2	0	4	3
1934	6	29	11	8	3	0	4	4
1935	7	36	18	8	3	0	6	4
1936	10	45	15	9	4	0	9	6
1937	18	59	19	15	5	0	10	7
1938	9	52	23	10	4	0	10	7
1939	10	58	16	10	6	0	10	9
1946	17	55	21	28	13	4	23	32
1947	31	60	23	30	17	6	39	34
1948	35	74	25	42	22	5	53	36
1949	42	92	28	56	15	14	43	39
1950	38	105	34	59	16	13	51	39
1951	45	137	49	84	25	19	65	36
1952	50	151	47	97	46	22	85	42
1953	38	163	44	58	39	31	85	43
1954	41	182	48	58	37	40	43	42
1955	37	215	47	71	48	100	92	56

Commodity Distribution of Canada's Exports (Cont'd)

	Other chemicals (f)	Alcoholic beverages	Rubber products	Textiles and products (g)	Electrical apparatus (h)	Engines and boilers	Farm machinery and implements (i)
1926	12	25	26	6	1	0	17
1927	12	27	28	8	1	0	16
1928	13	28	30	7	2	0	14
1929	14	30	32	8	2	0	20
1930	11	23	25	7	1	0	10
1931	9	12	13	5	1	0	3
1932	8	12	7	4	1	0	2
1933	10	9	8	5	1	0	1
1934	11	20	12	7	1	0	3
1935	12	13	12	8	2	0	6
1936	12	23	14	10	2	0	6
1937	15	21	18	13	3	0	10
1938	12	11	15	12	3	0	8
1939	15	8	16	13	2	0	7
1946	43	36	14	50	20	29	29
1947	57	28	25	47	17	20	42
1948	52	29	24	43	14	12	74
1949	44	35	12	23	12	31	93
1950	62	44	12	26	11	15	88
1951	96	56	28	34	18	10	106
1952	82	57	17	25	34	10	105
1953	95	66	8	22	38	13	74
1954	119	63	11	19	23	24	77
1955	154	65	9	21	21	30	76

Commodity Distribution of Canada's Exports (Cont'd)

	Non-farm machinery	Auto- mobiles, trucks and parts	Other vehicles, chiefly of iron (<i>j</i>)	Guns, rifles and other firearms	Railway track material of iron and steel	Other mfrs. of iron and steel (<i>k</i>)	Ships and vessels	Aircraft and parts
1926	4	38	0	0	9	0	0	
1927	6	32	0	0	8	1	0	
1928	8	36	0	0	7	0	0	
1929	7	47	0	0	8	1	0	
1930	6	20	0	0	6	1	0	
1931	4	7	0	0	4	1	0	
1932	4	7	0	0	3	0	0	
1933	3	10	0	0	4	0	0	
1934	5	20	0	0	6	0	0	
1935	6	26	0	0	7	0	0	
1936	7	23	0	0	8	0	0	
1937	11	27	0	0	9	1	0	
1938	10	25	0	0	8	0	3	
1939	11	26	0	0	10	0	0	
1946	16	78	34	4	0	13	19	10
1947	41	92	15	0	0	21	26	6
1948	41	55	21	2	2	20	84	11
1949	32	39	23	2	0	16	42	25
1950	26	40	5	0	0	13	23	4
1951	40	79	3	0	0	19	9	8
1952	47	111	4	6	0	16	12	38
1953	37	75	6	24	0	12	20	40
1954	37	27	4	40	0	10	9	28
1955	36	40	7	4	4	11	6	20

Commodity Distribution of Canada's Exports (Concl'd)

	Cartridges	Other commercial exports	Non-commercial items (l)	New gold production available for export	Re-exports	Total exports of goods
1926	0	9	7	30	15	1,307
1927	0	10	6	32	20	1,263
1928	0	11	6	40	24	1,404
1929	0	13	6	37	26	1,215
1930	0	12	6	39	19	922
1931	0	10	4	57	12	657
1932	0	7	3	70	8	568
1933	0	7	3	82	6	617
1934	0	8	3	114	7	770
1935	0	9	3	119	13	857
1936	0	12	3	132	13	1,072
1937	0	13	3	145	15	1,190
1938	0	14	3	161	11	1,003
1939	1	12	2	184	11	1,095
1946	1	27	39	96	27	2,473
1947	2	33	22	99	37	2,911
1948	3	25	22	119	35	3,229
1949	14	18	18	139	29	3,161
1950	3	16	14	163	39	3,320
1951	2	31	17	150	49	4,113
1952	10	25	19	150	55	4,506
1953	20	24	20	144	55	4,317
1954	14	20	21	155	66	4,102
1955	4	27	23	155	69	4,506

(a) Based upon data issued by the Board of Grain Commissioners for the years 1936-39 and 1946.

(b) Excludes alcoholic beverages, synthetic rubber and rubber products. Includes all soups, which were classified, in whole or in part, under meats in *Trade of Canada* in prewar years.

(c) Excludes soups. See footnote (b).

(d) Excludes electrical apparatus. Also includes lead scrap until 1948.

(e) Includes ferro-alloys and scrap.

(f) Includes synthetic rubber and uranium oxide.

(g) Includes synthetic fibres.

(h) Excludes electric stoves and parts and electric cooking and heating devices, n.o.p., included in this category in *Trade of Canada* up to 1948 and subsequently in "other manufactures of iron and steel".

(i) Includes farm tractors in 1949 and subsequent years.

(j) Includes farm tractors up to 1948.

(k) Includes also electric stoves and parts and electric cooking and heating devices, n.o.p. See footnote (h).

(l) Settlers' effects and, in the postwar period, donations and gifts.

THE WHEAT ADJUSTMENT AND DESTINATION OF CANADA'S DOMESTIC MERCHANDISE EXPORTS

AN EXAMINATION of data relating to Canada's wheat exports, made by the D.B.S. and the Research Department of the Bank of Canada during the 1930's and early 1940's, revealed that the customs data, on which the export statistics published in *Trade of Canada* were based, reflected inaccurately the movement of Canadian wheat. A large quantity of wheat was shown as exported to the United Kingdom, although eventually it was diverted to other European destinations and sometimes to the United States. Frequently, the wheat was shipped "on orders" and the final destination was not known at the time that the ships left Canadian ports. Similarly, the large volume of Canadian wheat customarily stored in United States elevators was for some periods shown as exported to the United Kingdom as a general practice, because the final destination was not known at the time of shipment. Much of this wheat was eventually sold on the continent of Europe, although it was originally recorded as an export to the United Kingdom. The general effect of this practice was that exports to the United Kingdom were greatly exaggerated, while exports to European countries were greatly understated, particularly during the 1920's. To a less extent, exports to the United States were also understated, notably during the period of drought in the United States Midwest.¹

On the basis of data from United Kingdom, United States and Canadian sources, adjustments were made to rectify this distortion. Adjustments have been made in the balance of payments data for the period 1926-37 and in the trade data published by the Bank of Canada in its *Statistical Summary*. Throughout this study, the adjustment used in the latter source has been employed for the period 1926 to July 1936. Wheat exports (and total exports) to the United Kingdom have been reduced on the basis of data furnished by the Bank of Canada, and exports to continental Western Europe have been increased by the same amount. The magnitude of the adjustment for the period 1926 to 1935 can be seen from Table III.² For these years, the adjustment is the same as the difference between the data on exports to the United Kingdom published in *Trade of Canada* and the Bank's *Statistical Summary*.³

From the crop year beginning in August 1936, records of the final destinations of Canadian wheat to overseas countries have been maintained by the Board of Grain Commissioners for Canada. Shipments from North

¹ See, e.g., D.B.S., *The Canadian Balance of International Payments, 1926 to 1948*, pp. 107-108.

² As is noted below, 1936 data employed are obtained partly by this method and partly by that used for the years 1937-39 and 1946.

³ See D.B.S., *Trade of Canada, 1954*, Vol. I, pp. 22-23; and Bank of Canada, *Statistical Summary, 1950 Supplement*, p. 120 (and errata re other destinations).

American ports have been followed up and classified according to the countries of destination. In addition, the Board has issued data, obtained from United States official sources, on imports by the United States — divided into imports for home consumption and imports for grinding in bond. For the calendar years 1937, 1938, 1939 and 1946, as well as for part of 1936, these data have been used as the basis for the data on wheat exports employed in this study.⁴ As the Board of Grain Commissioners' data were available in volume terms only, value figures were obtained through the use of average values calculated from the value and volume figures published in *Trade of Canada*.

The nature of the calculations, together with the resultant data on exports of wheat and wheat flour and on total domestic merchandise exports by destination can be seen from Table I (following) covering the calendar year 1937. The treatment of some of the problems raised by the data is indicated in the footnotes to the table. In this connection, it may be noted that United States imports for home consumption have been shown as exports to the United States, while imports for grinding in bond have been included in exports to "other Western Hemisphere" as this wheat is believed to have gone largely to Cuba after milling. Small quantities of wheat "held in store in Holland" have been allocated to continental Western Europe, for convenience under the same heading as wheat diverted from the United Kingdom in earlier years. Wrecked wheat shipments reported by the Board of Grain Commissioners have been ignored. Two valuation methods, both based upon unit values calculated from annual data in *Trade of Canada*, have been employed: under Method A, the quantities reported by the Board of Grain Commissioners for the various countries and groups of countries were valued by the unit value calculated from the total export value and quantity of wheat exported to all countries as reported in *Trade of Canada*; under Method B, separate unit values were calculated for each of the countries and groups, these unit values applied to the Board of Grain Commissioners' quantities, and the results summed. The maximum difference between the results of the two methods was \$5.5 million for 1946.

For the calendar year 1936, it was necessary to combine the type of adjustment used for 1926–35 and that used for 1937–39 and 1946. The former was used for the months of January to July and the latter for August to December.

The calculations involved for the years 1936 to 1939 and 1946 were undertaken in order to get a finer area breakdown of trade than that which has been produced by the Bank of Canada's calculations. Certain differences between the results produced by the two methods employed in this study and the data published by the Bank are indicated in Table II. The modest

⁴ The sources employed were various issues of Board of Grain Commissioners for Canada, *Annual Report*, and *Canadian Grain Exports*; and Dominion Bureau of Statistics, *Report on the Grain Trade of Canada* (prepared in collaboration with the Board of Grain Commissioners), and *Monthly Review of the Wheat Situation*. As the Board's "annual" figures are for crop years, it was necessary to employ monthly data to obtain results on a calendar year basis.

Table I

ADJUSTMENTS FOR WHEAT IN CANADA'S DOMESTIC MERCHANDISE EXPORTS — 1937

Destination (a)	Wheat-D.B.S. Data			Wheat-Bd. of Grain Com.
	\$ 000	bu. 000	Av. value \$ and cts. (3) = (1) ÷ (2) (b)	Calendar year bu. 000 (4)
	(1)	(2)		
1. United States.....	1,498	1,160	1.29	8,694 (c)
2. Venezuela.....	—	—	—	—
3. Brazil.....	—	—	—	—
4. Other Western Hemisphere.....	264	190	1.39	9,663 (d)
5. Total Western Hemisphere....	1,762	1,350	1.31	18,357
6. United Kingdom.....	95,794	73,927	1.30	59,841
7. Ireland and Iceland.....	3,341	2,341	1.43	4,401
8. Australia.....	—	—	—	—
9. New Zealand.....	180	119	1.50	119
10. India.....	—	—	—	—
11. Union of South Africa.....	15	10	1.40	88
12. British West Indies.....	17	11	1.53	52 (e)
13. Other sterling area.....	0	0	1.55	313
14. Total sterling area.....	99,347	76,410	1.30	64,814
15. Belgium-Luxembourg.....	9,318	7,359	1.27	10,059
16. France.....	1,149	853	1.35	4,162
17. Germany.....	2,471	1,994	1.24	3,664
18. Italy.....	654	536	1.22	568
19. Netherlands.....	4,134	3,150	1.31	4,526
20. Norway.....	1,582	1,279	1.24	3,043
21. Switzerland.....	—	—	—	1,747
22. Other Western Europe.....	942	685	1.37	5,927
23. Wheat diverted to the Continent				95 (f)
24. Overseas territories of Western Europe.....	1,252	1,230	1.22	1,463
25. Total Western Europe and territories.....	21,504	16,887	1.27	35,254
26. Japan.....	1,566	1,173	1.33	1,173
27. U.S.S.R., Eastern Europe and China.....	2	1	2.13	—
28. All other countries.....	255	186	1.37	1,554
29. Total (excluding Newfoundland).....	124,438	96,007	1.30	121,152
30. Newfoundland.....	2	1	1.42	—
31. Total all countries.....	124,440	96,008	1.30 (3a)	121,152

Table I (Cont'd)

	Adjusted Wheat Value		Flour- D.B.S. \$ 000 (7)	Adjusted Wheat and Flour	
	Method A	Method B		Method A	Method B
	\$ 000			\$ 000	
	(5) = (4) × (3a)	(6) = (4) × (3)		(8) = (5) + (7)	(9) = (6) + (7)
1.....	11,302	11,215	208	11,510	11,423
2.....	—	—	212	212	212
3.....	—	—	37	37	37
4.....	12,562	13,432	156	12,718	13,588
5.....	23,864	24,647	613	24,477	25,260
6.....	77,793	77,793	13,538	91,331	91,331
7.....	5,721	6,293	59	5,780	6,352
8.....	—	—	1	1	1
9.....	155	179	7	162	186
10.....	—	—	1	1	1
11.....	114	123	14	128	137
12.....	68	80	3,515	3,583	3,595
13.....	407	485	1,765	2,172	2,250
14.....	84,258	84,953	18,900	103,158	103,853
15.....	13,077	12,775	6	13,083	12,781
16.....	5,411	5,619	0	5,411	5,619
17.....	4,763	4,543	1	4,764	4,544
18.....	738	693	7	745	700
19.....	5,884	5,929	107	5,991	6,036
20.....	3,956	3,773	583	4,539	4,356
21.....	2,271	2,271 (<i>h</i>)	—	2,271	2,271
22.....	7,705	8,120	19	7,724	8,139
23.....	124	124 (<i>h</i>)	—	124	124
24.....	1,902	1,785	251	2,153	2,036
25.....	45,831	45,632	974	46,805	46,606
26.....	1,525	1,560	458	1,983	2,018
27.....	—	—	218	218	218
28.....	2,020	2,129	1,005	3,025	3,134
29.....	157,498 (<i>g</i>)	158,921 (<i>i</i>)	22,168	179,666	181,089
30.....	—	—	1,705	1,705	1,705
31.....	157,498	158,921	23,873	181,371	182,794

Table I (Concl'd)

	Total Exports-D.B.S. (all commodities)	Adjusted Total Exports	
	\$ 000 (10)	Method A	Method B
		$(11) = (10) + (5) - (1)$	$(12) = (10) + (6) - (1)$
		\$ 000	
1.....	360,012	369,816	369,729
2.....	1,320	1,320	1,320
3.....	5,003	5,003	5,003
4.....	18,670	30,968	31,838
5.....	385,005	407,107	407,890
6.....	402,062	384,061	384,061
7.....	4,452	6,832	7,404
8.....	30,597	30,597	30,597
9.....	14,689	14,664	14,688
10.....	4,652	4,652	4,652
11.....	16,600	16,699	16,708
12.....	11,197	11,248	11,260
13.....	12,467	12,874	12,952
14.....	496,716	481,627	482,322
15.....	17,011	20,770	20,468
16.....	8,362	12,624	12,832
17.....	11,737	14,029	13,809
18.....	2,748	2,830	2,785
19.....	12,521	14,271	14,316
20.....	6,223	8,597	8,414
21.....	618	2,889	2,889
22.....	4,774	11,537	11,952
23.....		124	124
24.....	4,667	5,317	5,200
25.....	68,661	92,988	92,789
26.....	25,799	25,758	25,793
27.....	6,556	6,554	6,554
28.....	5,505	7,270	7,379
29.....	988,242	1,021,304	1,022,727
30.....	9,126	9,124	9,124
31.....	997,368	1,030,428	1,031,851

(a) See footnotes to Table III.

(b) Calculated from data in units, rather than in thousands as in columns (1) and (2).

(c) Shipments to U.S. "for home consumption".

(d) Includes shipments to U.S. "for grinding in bond", believed to have gone largely to Cuba.

(e) Presented as "West Indies".

(f) Wheat "held in store in Holland".

(g) Calculated by formula. The column sums to the same amount.

(h) Based on Method A, as data for Method B are not available.

(i) Sum of the individual items.

SOURCES: D.B.S., *Trade of Canada and Report on the Grain Trade for the Crop Year Ended July 31 and to the Close of Navigation, 1937*; *Annual Report of the Board of Grain Commissioners for Canada for the Year 1938*.

Table II

**CANADA'S TOTAL DOMESTIC MERCHANDISE EXPORTS
ADJUSTED FOR WHEAT**
(*millions of Canadian dollars*)

	1936	1937	1938	1939	1946
All countries					
Bank of Canada data (a).....	927	1,030	835	897	2,352
Method A.....	928	1,030	832	900	2,350
Method B.....	929	1,032	835	898	2,356
United States..					
Bank of Canada data (a).....	348	382	261	337	880
Method A.....	342	370	258	330	870
Method B.....	342	370	258	330	870
U.S. imports for grinding in bond(b)	6	12	3	7	10
United Kingdom					
Bank of Canada data (a).....	356	385	333	331	631
Method A.....	329	384	333	333	631
Method B.....	329	384	336	332	628
Wheat diverted, Jan.-July.....	27				

(a) Data on total merchandise exports from Bank of Canada, *Statistical Summary, 1950 Supplement*, p. 120, less re-exports, obtained from D.B.S., *Trade of Canada, 1954*, Vol. I, pp. 20, 23 and 25.

(b) Calculated by Method A. Method B yields the same results, except that for 1938 it rounds to 2 (million).

differences in the results for exports to all countries, and for exports to the United Kingdom in the years 1937-39 and 1946, arise from the fact that, whereas the Bank made its unit value and total value calculations on a monthly basis (using an approach akin to Method A), the value calculations for this study were done on the basis of calendar years because of the larger number of countries for which it was desired to present data. Secondly, it would appear that the Bank treated United States imports for grinding in bond as part of Canada's exports to the United States, whereas in this study they are treated as going to other Western Hemisphere countries. Finally, the difference in the United Kingdom figures for 1936 would appear to be the result of the Bank's not taking account of the diversion of wheat to the Continent in the last seven months of the crop year 1935-36. This also involves an equal but opposite difference in the 1936 figures for Western Europe.

For the period after 1946, the Board of Grain Commissioners' data differ to only a relatively small extent from those in *Trade of Canada*. As the adjustment has shortcomings in arriving at appropriate value figures, it is felt preferable to use *Trade of Canada* figures for the years 1947 to 1955. In

this, the present study agrees with the practice followed by the Bank of Canada which no longer makes the wheat adjustment in the figures published in the *Statistical Summary*.

Having completed the wheat adjustment to the trade data, it is possible to present Table III (following) showing the destination of Canada's domestic merchandise exports (all commodities except gold) for the years 1926 to 1939 and 1946 to 1955.⁵ In the construction of this table, the wheat export data provided by the Board of Grain Commissioners for the period August 1936 to December 1939 and for the year 1946 have been valued by Method A described above.

⁵ This is not to deny the existence of distortions in the export data for commodities other than wheat. These, however, are not felt to be sufficiently serious to justify further adjustment of the data, especially as this would still result only in approximations.

Table III

**DESTINATION OF CANADA'S
DOMESTIC MERCHANDISE EXPORTS (a)**
(millions of Canadian dollars)

	United States	Venezuela	Brazil	Other West. Hemisphere (b)	Total West. Hemisphere	United Kingdom		
						Trade of Canada	Wheat diverted	Net
1926	458	2	7	35	503	459	143	316
1927	467	2	5	29	503	410	138	271
1928	482	2	6	31	520	446	157	289
1929	493	2	5	38	537	290	65	225
1930	373	1	3	26	404	235	60	175
1931	240	1	1	12	254	171	30	140
1932	159	0	1	8	168	178	27	151
1933	168	0	2	8	179	211	23	188
1934	219	0	3	12	233	270	33	238
1935	262	1	4	12	278	304	41	262
1936	342	1	4	19	366		27	329
1937	370	1	5	31	407			384
1938	258	1	4	16	279			333
1939	330	2	4	22	358			333
1946	870	11	25	68	974			631
1947	1,034	13	32	88	1,167			751
1948	1,501	17	29	81	1,628			687
1949	1,503	28	17	88	1,636			705
1950	2,021	25	16	111	2,173			470
1951	2,298	27	54	138	2,516			631
1952	2,307	36	81	164	2,588			746
1953	2,419	36	38	133	2,626			665
1954	2,317	31	45	120	2,513			653
1955	2,559	31	12	130	2,731			769

Table III (Cont'd)

	Ireland and Iceland	Australia	New Zealand	India (c)	Union of S. Africa (d)	British West Indies (e)	Other sterling area (f)	Total sterling area
1926	6	18	15	10	9	14	12	401
1927	5	16	11	11	9	15	12	350
1928	4	16	15	12	11	15	13	377
1929	3	19	20	9	13	16	13	318
1930	3	9	15	8	10	13	12	245
1931	3	5	5	4	9	10	8	183
1932	3	7	3	3	4	7	6	184
1933	3	10	4	3	6	7	5	226
1934	4	17	7	5	12	7	7	296
1935	3	23	8	4	12	8	9	330
1936	4	26	12	3	15	9	8	406
1937	7	31	15	5	17	11	13	482
1938	4	33	16	3	16	11	11	427
1939	4	32	12	5	18	12	12	428
1946	11	38	16	40	68	49	37	892
1947	20	60	37	43	67	65	65	1,109
1948	11	38	18	34	83	45	59	975
1949	10	35	14	73	78	33	59	1,007
1950	14	35	11	32	43	23	42	670
1951	22	49	22	36	53	31	55	898
1952	24	50	19	55	48	32	60	1,034
1953	15	40	7	37	51	32	68	915
1954	9	46	15	18	40	34	45	860
1955	13	58	22	25	56	36	41	1,022

Table III (*Cont'd*)

	Belgium- Luxembourg	France	Germany, Federal Republic (g)	Italy	Netherlands	Norway	Switzerland
1926	21	15	31	17	26	6	1
1927	18	12	40	25	27	7	0
1928	28	14	46	23	48	7	1
1929	24	17	32	13	21	5	1
1930	15	14	15	15	11	3	1
1931	14	17	12	6	14	3	0
1932	15	14	8	4	17	4	0
1933	12	12	10	4	18	4	0
1934	12	10	6	3	11	4	0
1935	9	8	4	3	8	5	1
1936	23	12	7	7	14	7	2
1937	21	13	14	3	14	9	3
1938	11	10	20	2	11	8	4
1939	10	7	8	2	11	12	4
1946	66	78	9	24	34	20	12
1947	53	81	7	36	56	20	14
1948	33	93	13	32	44	23	19
1949	57	36	23	13	14	22	32
1950	66	18	9	15	9	19	26
1951	94	47	37	49	26	32	25
1952	104	48	95	53	42	39	27
1953	70	32	84	33	42	37	30
1954	55	34	87	24	40	44	27
1955	53	43	91	28	48	47	26

Table III (Cont'd)

	Other Western Europe (h)	Wheat diverted to the Continent (i)	Overseas territories of Western Europe (j)	Total Western Europe and territories	Japan
1926	17	143	2	279	38
1927	16	138	4	288	30
1928	26	157	6	355	39
1929	17	65	9	204	38
1930	15	60	13	163	23
1931	9	30	12	118	16
1932	7	27	11	107	12
1933	4	23	7	95	13
1934	4	33	2	86	16
1935	3	41	3	85	15
1936	12	27	5	117	20
1937	12	0	5	93	26
1938	12		3	81	21
1939	9		3	66	
1946	32		21	296	1
1947	36		17	320	1
1948	35		16	309	8
1949	37		15	249	6
1950	19		17	199	21
1951	30		23	364	73
1952	41		21	470	103
1953	23		15	367	119
1954	21		16	347	96
1955	24		14	373	91

Table III (Concl'd)

	U.S.S.R., Eastern Europe, mainland China (k)	All other countries (l)	Total (excluding Newfoundland)	Newfoundland	Total all countries
1926	21	10	1,250	11	1,261
1927	20	9	1,199	11	1,211
1928	22	15	1,328	11	1,339
1929	32	12	1,141	12	1,152
1930	11	7	852	11	864
1931	8	3	581	7	588
1932	9	4	484	6	490
1933	7	4	523	6	529
1934	5	6	643	7	649
1935	5	6	718	7	725
1936	5	6	920	7	928
1937	7	7	1,021	9	1,030
1938	9	6	823	8	832
1939	5	7	892	9	900
1946	95	54	2,312	38	2,350
1947	71	53	2,720	55	2,775
1948	48	52	3,020	55	3,075
1949	20	66	2,984	9	2,993
1950	6	50	3,118		3,118
1951	1	62	3,914		3,914
1952	2	105	4,301		4,301
1953	0	90	4,117		4,117
1954	6	59	3,881		3,881
1955	12	53	4,282		4,282

(a) Based upon data in D.B.S., *Trade of Canada* adjusted to reflect (a) diversion to the continent of Europe of wheat originally destined for the United Kingdom, in the period 1926 to July 1936, and (b) Board of Grain Commissioners' data for wheat exports for the period August 1936 to the end of 1939 and in 1946. See text.

(b) Excluding Newfoundland, sterling area territories and overseas territories of Western European countries.

(c) Includes Burma prior to 1938 and Pakistan prior to 1948.

(d) Includes Southern Rhodesia prior to 1933 and Northern Rhodesia and other British South Africa prior to 1947.

(e) Bahamas, Barbados, Jamaica, Leeward and Windward Islands, and Trinidad and Tobago.

(f) Burma, Ceylon, Iraq, Jordan, Libya, Pakistan, the Federation of Rhodesia and Nyasaland, and the present overseas territories of the United Kingdom (other than the West Indies). See, however, footnotes (c) and (d) above.

(g) All Germany prior to 1952.

(h) Austria, Denmark, Greece, Portugal, Sweden and Turkey.

(i) The estimates for the period 1926 to July 1936 cannot be allocated by country. The 1937 figure is the Board of Grain Commissioners' item for wheat "held in store in Holland".

(j) Currently associated territories. Excludes Spanish territories.

(k) Includes Taiwan prior to 1953.

(l) Excluding Newfoundland.

MAJOR ITEMS IN CANADA'S EXPORTS TO THE UNITED STATES

THE FOLLOWING table shows Canada's domestic merchandise exports of a number of commodity items to the United States and to the world as a whole for each of the years 1937, 1947, 1948, 1950 and 1955. Index numbers of value and volume (1947 = 100) and the United States share of the total are also shown for each commodity for each year. The sources of the data are the detailed export breakdown in *Trade of Canada* and, for wheat in 1937, data issued by the Board of Grain Commissioners (see Appendix D). Commodity items were selected on the basis of their importance in each year, at least the ten most important items being covered, and include all changes in exports to the United States in excess of \$20 million. An exception to this is that basket items in *Trade of Canada* (such as "other chemicals and allied products, n.o.p.") were not included. Additional wood pulp, aluminum and asbestos items were included to increase the comparability of the data over time.

MAJOR ITEMS IN CANADA'S EXPORTS TO THE UNITED STATES

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Barley										
— \$ million.....	2.5	7.9	0.3	1.2	14.6	26.9	19.4	23.4	23.0	76.5
1947 = 100.....	891	654	100	100	5,182	2,225	6,893	1,936	8,146	6,314
U.S. %.....	32		23		54		83		30	
— bu. million.....	3.0	10.9	0.1	0.6	10.2	18.9	11.9	15.1	19.2	63.9
1947 = 100.....	2,462	1,912	100	100	8,506	3,324	9,918	2,645	(a)	(a)
U.S. %.....	27		21		54		79		30	
Wheat										
— \$ million.....	11.3	157.5	0.4	265.2	6.6	243.0	28.5	325.6	10.6	338.2
1947 = 100.....	3,374	59	100	100	1,861	92	8,024	123	2,977	128
U.S. %.....	7		0		3		9		3	
— bu. million.....	8.7	121.2	0.2	160.4	3.2	135.6	15.0	163.0	6.3	190.0
1947 = 100.....	5,175	76	100	100	1,895	85	8,899	102	3,763	118
U.S. %.....	7		0		2		9		3	
Whisky										
— \$ million.....	20.7	21.0	18.0	23.0	23.2	27.0	33.5	41.7	54.1	60.9
1947 = 100.....	115	91	100	100	129	117	186	181	301	265
U.S. %.....	98		78		86		80		89	
— pf. gal. million.....	5.3	5.4	2.8	3.5	3.2	3.7	3.7	4.7	6.2	7.1
1947 = 100.....	188	155	100	100	114	107	131	136	218	203
U.S. %.....	99		81		86		78		87	
Cattle, n.o.p., over 700 lbs.										
— \$ million.....	11.0	12.0	0	0.6	40.0	40.5	41.5	41.6	3.7	3.7
1947 = 100.....	(b)	2,060	100	100	(c)	6,951	(c)	7,142	(b)	636
U.S. %.....	91		1		99		100		99	
— No. 000.....	163	176	0	5	239	242	203	203	20	20
1947 = 100.....	(b)	3,484	100	100	(b)	4,799	(b)	4,023	(a)	395
U.S. %.....	93		1		99		100		98	

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Beef and veal, fresh, chilled and frozen (d)										
— \$ million.....	0.3	1.2	0	9.2	26.3	36.6	32.9	34.2	2.2	2.7
1947 = 100	2,027	13	100	100	(b)	396	(b)	371	(a)	29
U.S. %	28		0		72		96		82	
— cwt. 000.....	30	161	1	426	801	1,229	818	840	77	87
1947 = 100.....	3,394	38	100	100	(a)	288	(a)	197	8,703	20
U.S. %	19		0		65		97		88	
Planks and boards, cedar.....										
— \$ million.....	1.7	2.4	9.2	16.3	15.6	19.0	27.7	28.7	35.8	39.2
1947 = 100	19	15	100	100	170	116	302	176	390	240
U.S. %	71		56		82		97		91	
— ft. million.....	31	58	83	156	116	153	176	186	294	332
1947 = 100	37	37	100	100	140	98	212	119	354	213
U.S. %	53		53		76		95		89	
Planks and boards, Douglas fir										
\$ million.....	2.2	15.4	6.1	65.6	21.0	60.5	58.3	83.9	85.9	137.4
1947 = 100	36	23	100	100	345	92	959	128	1,412	209
U.S. %	14		9		35		69		63	
— ft. million.....	107	739	99	878	312	802	803	1,147	1,188	1,785
1947 = 100	108	84	100	100	315	91	811	131	1,200	203
U.S. %	14		11		39		70		67	
Planks and boards, hemlock										
\$ million.....	0.3	2.9	2.6	19.0	9.6	20.2	33.7	37.2	26.1	55.7
1947 = 100	12	15	100	100	373	106	1,303	196	1,010	294
U.S. %	10		14		48		91		47	
— ft. million.....	19	192	41	236	139	268	485	536	328	704
1947 = 100	46	81	100	100	339	114	1,183	227	800	298
U.S. %	10		17		52		90		47	

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Planks and boards, spruce										
— \$ million.....	6.7	14.5	39.4	71.9	52.8	60.5	87.2	93.3	92.6	111.3
1947 = 100.....	17	20	100	100	134	84	221	130	235	155
U.S. %.....	46		55		87		93		83	
— ft. million.....	251	590	569	1,040	732	850	1,137	1,235	1,189	1,426
1947 = 100.....	44	57	100	100	129	82	200	119	209	137
U.S. %.....	43		55		86		92		83	
Shingles, red cedar										
— \$ million.....	5.8	5.9	19.4	20.0	20.7	22.2	31.4	32.1	28.0	28.8
1947 = 100.....	30	30	100	100	107	111	162	160	145	144
U.S. %.....	98		97		94		98		97	
— square million.....	2.0	2.1	2.0	2.0	2.2	2.3	2.8	2.9	2.4	2.5
1947 = 100.....	104	103	100	100	113	115	144	142	123	122
U.S. %.....	98		96		95		97		97	
Pulpwood, other than poplar, peeled										
— \$ million.....	8.6	9.3	11.4	11.4	15.0	15.4	16.6	17.2	18.7	27.9
1947 = 100.....	76	82	100	100	132	135	146	152	165	245
U.S. %.....	93		100		98		96		67	
— cord million.....	1.1	1.1	0.6	0.6	0.7	0.8	0.8	0.8	0.8	1.0
1947 = 100.....	174	185	100	100	123	125	130	134	129	172
U.S. %.....	94		100		98		97		75	
Pulpwood, other than poplar, not peeled										
— \$ million.....	1.8	1.8	20.0	20.5	23.3	24.3	13.7	13.9	12.2	12.2
1947 = 100.....	9	9	100	100	116	118	69	68	61	60
U.S. %.....	100		98		96		99		100	
— cord million.....	0.2	0.2	1.1	1.1	1.1	1.1	0.6	0.6	0.5	0.5
1947 = 100.....	23	23	100	100	105	107	59	58	45	44
U.S. %.....	100		98		96		99		100	

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Wood pulp, sulphate (kraft), bleached										
— \$ million.....	6.2	6.8	23.3	23.4	32.5	32.7	51.3	51.4	81.1	90.0
1947 = 100			100	100	140	140	220	219	348	388
U.S. %.....	91		99		99		100		89	
— cwt. million.....	2.3	2.5	3.6	3.6	4.6	4.7	7.8	7.8	12.0	13.4
1947 = 100			100	100	128	128	217	216	333	370
U.S. %.....	93		99		100		100		90	
Wood pulp, sulphate (kraft), unbleached										
— \$ million.....			12.6	13.8	16.1	18.7	16.6	18.9	16.7	22.1
1947 = 100			100	100	128	135	132	137	133	160
U.S. %.....			91		86		88		76	
— cwt. million.....			2.5	2.7	2.7	3.1	3.4	3.8	3.2	4.4
1947 = 100			100	100	109	116	135	140	128	164
U.S. %.....			92		87		89		72	
Wood pulp, sulphite, bleached, dissolving										
— \$ million.....	17.4	22.1	31.0	39.0	36.2	46.1	38.0	45.5	35.7	58.4
1947 = 100			100	100	117	118	123	117	115	150
U.S. %.....	79		80		78		84		61	
— cwt. million.....	5.8	7.4	4.7	5.8	4.9	6.2	4.8	5.8	3.9	6.6
1947 = 100			100	100	106	106	103	99	84	113
U.S. %.....	79		80		80		83		59	
Wood pulp, sulphite, bleached, paper grades										
— \$ million.....			27.5	30.3	30.0	32.4	32.3	32.4	45.7	58.9
1947 = 100			100	100	109	107	118	107	167	194
U.S. %.....			91		93		100		78	
— cwt. million.....			4.5	4.8	4.6	4.8	5.3	5.4	7.0	9.1
1947 = 100			100	100	101	100	118	111	155	189
U.S. %.....			93		94		100		77	

Major Items in Canada's Exports to the United States (cont'd.)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Wood pulp, sulphite, unbleached, strong										
— \$ million.....	5.0	7.9	27.2	32.6	30.8	38.1	24.6	29.0	24.5	27.3
1947 = 100.....			100	100	114	117	91	89	90	84
U.S. %.....	64		83		81		85		90	
— cwt. million.....	2.3	3.5	5.3	6.3	5.4	6.6	4.9	5.7	4.3	4.8
1947 = 100.....			100	100	102	105	92	90	81	76
U.S. %.....	65		84		82		85		89	
Wood pulp, sulphite, unbleached, news grade.....										
— \$ million.....			15.5	16.3	18.9	20.4	10.2	12.8	8.4	15.3
1947 = 100.....			100	100	121	125	66	79	54	94
U.S. %.....			95		93		80		55	
— cwt. million.....			3.2	3.3	3.4	3.7	2.0	2.5	1.5	2.6
1947 = 100.....			100	100	107	109	63	74	47	78
U.S. %.....			94		92		80		57	
Newsprint paper										
— \$ million.....	105.7	126.5	291.9	342.3	340.3	383.1	463.2	485.7	578.3	665.9
1947 = 100.....	36	37	100	100	117	112	159	142	198	195
U.S. %.....	84		85		89		95		87	
— cwt. million.....	58	69	74	84	78	87	94	99	101	115
1947 = 100.....	79	82	100	100	107	103	129	117	137	137
U.S. %.....	84		87		91		96		87	
Iron ore										
— \$ million.....	0	0	6.0	6.0	5.3	5.3	12.3	13.3	79.7	99.8
1947 = 100.....	0	0	100	100	88	88	205	221	1,323	1,657
U.S. %.....	100		100		100		93		80	
— ton million.....	0	0	1.7	1.7	1.1	1.1	2.0	2.2	11.2	14.6
1947 = 100.....	0	0	100	100	61	61	116	127	639	833
U.S. %.....	100		100		100		91		77	

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Reaper-threshers										
— \$ million.....	0.2	0.8	7.2	12.8	21.1	28.1	27.2	32.3	25.9	29.8
1947 = 100.....	3	7	100	100	294	219	380	251	361	232
U.S. %.....	29		56		75		84		87	
— No. 000.....	0	1	3	6	10	12	10	11	8	9
1947 = 100.....	0	16	100	100	333	200	333	183	267	150
U.S. %.....	0		50		83		91		89	
Aluminum in primary forms										
— \$ million.....	3.8	17.6	3.9	52.6	19.1	84.2	45.9	96.4	76.1	197.7
1947 = 100.....			100	100	488	160	1,174	183	1,948	376
U.S. %.....	22		7		23		48		39	
— cwt. million.....	0.3	1.0	0.3	4.3	1.6	6.5	3.2	6.7	3.9	10.1
1947 = 100.....			100	100	479	153	988	157	1,192	237
U.S. %.....	26		8		24		48		38	
Aluminum, semi-fabricated (e)										
— \$ million.....			0	2.1	1.5	3.4	1.9	5.5	4.0	9.1
1947 = 100.....			100	100	5,321	165	6,679	266	(a)	442
U.S. %.....			1		45		35		44	
— cwt. 000.....			1	78	60	123	74	229	121	333
1947 = 100.....			100	100	6,000	158	7,400	294	(a)	427
U.S. %.....			1		49		32		36	
Aluminum wire and cable (f)										
— \$ million.....			0	2.5	0	5.5				
1947 = 100.....			100	100	1,093	218				
U.S. %.....			0		0					

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Copper in ingots, bars, cakes, slabs and billets										
— \$ million.....	0	38.7	0.4	33.5	8.0	50.7	22.7	59.7	48.8	109.6
1947 = 100.....	0	116	100	100	1,819	151	5,126	178	(a)	327
U.S. %.....	0		1		16		38		45	
— cwt. million.....	0	3.0	0	1.7	0.4	2.3	1.0	2.7	1.3	3.1
1947 = 100.....	0	169	100	100	1,724	133	4,805	153	6,386	175
U.S. %.....	0		1		16		38		44	
Lead in pigs, refined lead										
— \$ million.....	0	17.0	12.7	29.1	17.2	32.8	29.5	32.2	8.7	22.1
1947 = 100.....	0	58	100	100	136	113	233	111	69	76
U.S. %.....	0		44		53		92		40	
— cwt. million.....	0	3.5	1.2	2.5	1.1	2.1	2.1	2.3	0.7	1.9
1947 = 100.....	0	141	100	100	91	83	180	92	59	74
U.S. %.....	0		47		51		91		37	
Nickel, fine										
— \$ million.....	19.8	42.9	31.3	39.1	42.3	44.5	56.7	57.6	123.8	134.8
1947 = 100.....	63	110	100	100	135	114	181	147	395	345
U.S. %.....	46		80		95		98		92	
— cwt. million.....	0.8	1.4	1.2	1.4	1.4	1.4	1.3	1.3	2.0	2.1
1947 = 100.....	68	97	100	100	117	101	114	95	168	150
U.S. %.....	58		82		95		99		92	
Zinc in ore (net weight and value)										
— \$ million.....	0	2.6	2.9	2.9	4.8	4.8	8.8	17.4	20.5	23.0
1947 = 100.....	0	90	100	100	163	163	303	597	704	788
U.S. %.....	0		100		100		51		89	
— cwt. million.....	0	0.7	0.8	0.8	1.1	1.1	1.5	2.6	3.4	3.8
1947 = 100.....	0	81	100	100	134	134	189	319	414	470
U.S. %.....	0		100		100		59		88	

Major Items in Canada's Exports to the United States (cont'd)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Zinc spelter										
— \$ million.....	0.8	12.7	11.2	26.7	20.2	36.7	29.8	40.6	26.8	47.1
1947 = 100.....	7	48	100	100	181	138	267	152	240	177
U.S. %.....	6		42		55		73		57	
— cwt. million.....	0.1	2.7	1.1	2.7	1.5	2.9	2.2	2.9	2.3	4.3
1947 = 100.....	13	98	100	100	137	106	196	107	205	156
U.S. %.....	5		40		52		74		53	
Asbestos, crude										
— \$ million.....	0.3	0.4	0.4	0.6	0.4	0.6	0.3	0.5	0.2	0.5
1947 = 100.....	100	100	100	100	122	125	111	122	69	108
U.S. %.....	67		67		65		61		43	
— ton 000.....	647	953	644	872	100	92	555	845	250	586
1947 = 100.....	100	100	100	100	100	92	86	89	39	61
U.S. %.....	68		74				66		43	
Asbestos, milled fibres										
— \$ million.....	5.3	11.0	14.0	20.3	17.1	25.6	23.5	39.1	28.3	63.4
1947 = 100.....	100	100	100	100	122	126	168	193	203	313
U.S. %.....	49		69		67		60		45	
— ton 000.....	98	197	161	224	168	237	181	290	169	366
1947 = 100.....	100	100	100	100	104	106	112	129	105	163
U.S. %.....	50		72		71		62		46	
Asbestos waste, refuse or shorts										
— \$ million.....	2.9	3.2	11.1	11.6	14.5	15.3	20.4	23.1	24.7	30.9
1947 = 100.....	26	28	100	100	131	132	184	200	223	267
U.S. %.....	90		96		95		88		80	
— ton 000.....	177	195	396	412	431	452	486	539	524	635
1947 = 100.....	45	47	100	100	109	110	123	131	132	154
U.S. %.....	91		96		95		90		83	

Major Items in Canada's Exports to the United States (concluded)

	1937		1947		1948		1950		1955	
	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total	U.S.	Total
Petroleum, crude										
— \$ million.....	—	—	0	0	0	0	—	—	36.3	36.3
1947 = 100.....	—	—	100	100	384	384	—	—	(c)	(c)
U.S. %.....	—	—	100	100	100	100	—	—	100	100
— gal. million.....	—	—	0	0	0	0	—	—	519	519
1947 = 100.....	—	—	100	100	283	283	—	—	(c)	(c)
U.S. %.....	—	—	100	100	100	100	—	—	100	100
Abrasives, artificial, crude										
— \$ million.....	5.2	6.5	10.4	13.1	11.1	13.4	11.2	14.8	22.8	26.9
1947 = 100.....	51	50	100	100	107	102	109	113	221	206
U.S. %.....	80	79	79	79	83	83	76	76	85	85
— cwt. million.....	2.0	2.3	3.4	3.9	3.5	4.0	3.2	3.7	4.5	5.2
1947 = 100.....	59	57	100	100	104	102	93	95	132	131
U.S. %.....	89	87	87	87	88	88	85	85	87	87
Total of above items										
— \$ million.....	245.3	568.1	667.0	1,273.9	956.3	1,518.1	1,350.8	1,880.9	1,710.2	2,664.3
1947 = 100.....	37	45	100	100	143	119	203	148	256	209
U.S. %.....	43	43	52	52	63	63	72	72	64	64
Total domestic merchandise exports (g)										
— \$ million.....	369.8	1,030.4	1,034.2	2,774.9	1,501.0	3,075.4	2,021.0	3,118.4	2,559.3	4,281.8
1947 = 100.....	36	37	100	100	145	111	195	112	247	154
U.S. %.....	36	36	37	37	49	49	65	65	60	60

(a) Over 10,000.

(b) Over 100,000.

(c) Over 1,000,000.

(d) Appeared as "Beef, fresh, chilled and frozen" in 1937.

(e) Includes wire and cable in 1950 and 1955.

(f) Included with "aluminum manufactures, n.o.p." in 1937 and with semi-fabricated aluminum in 1950 and 1955.

(g) For comparability with the detailed items, exports to Newfoundland are included in the totals for 1937, 1947 and 1948.

MAJOR ITEMS IN CANADA'S EXPORTS TO THE UNITED KINGDOM

THE FOLLOWING table shows Canada's domestic merchandise exports of a number of commodity items to the United Kingdom and to the world as a whole for each of the years 1937, 1947, 1950 and 1955. As in the parallel table in Appendix E, index numbers of value and volume (here, however, 1937 = 100), and the United Kingdom share of the total, are also shown for each commodity for each year. Again the sources are the detailed export breakdown in *Trade of Canada* and, for wheat in 1937, data issued by the Board of Grain Commissioners (see Appendix D). Commodity items selected cover at least the ten most important exports to the United Kingdom in each year and all changes in these exports in excess of \$10 million. Again, however, basket items in *Trade of Canada* (such as "other chemicals and allied products, n.o.p.") are excluded. Because of their importance in 1947 and their subsequent decline, dried eggs might have been included, but were left out as data were not available for 1937. Additional aluminum items were included to increase the comparability of the data over time.

MAJOR ITEMS IN CANADA'S EXPORTS TO THE UNITED KINGDOM

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Barley								
— \$ million.....	4.8	7.9	0.8	1.2	—	23.4	43.8	76.5
1937 = 100.....	100	100	17	15	—	296	911	966
U.K. %.....	61		67		—		57	
— bu. million.....	7.1	10.9	0.4	0.6	—	15.1	36.7	63.9
1937 = 100.....	100	100	6	5	—	138	518	587
U.K. %.....	65		72		—		57	
Wheat								
— \$ million.....	77.8	157.5	209.0	265.2	173.7	325.6	148.3	338.2
1937 = 100.....	100	100	269	168	223	207	191	215
U.K. %.....	49		79		53		44	
— bu. million.....	60	121	136	160	87	163	82	190
1937 = 100.....	100	100	227	132	145	135	137	157
U.K. %.....	49		85		53		43	
Flour of wheat								
— \$ million.....	13.5	23.9	72.4	196.6	41.0	93.8	18.5	74.4
1937 = 100.....	100	100	535	823	303	393	136	312
U.K. %.....	57		37		44		25	
— bbl. million.....	2.3	4.1	8.6	18.1	4.3	10.1	2.4	8.6
1937 = 100.....	100	100	372	442	188	247	105	210
U.K. %.....	57		48		43		28	
Oil cake and meal								
— \$ million.....	0	0.2	—	0	—	2.6	15.1	15.4
1937 = 100.....	100	100	—	22	—	1,259	(a)	7,564
U.K. %.....	16		—		—		98	
— cwt. 000.....	19	123	—	15	—	765	3,636	3,733
1937 = 100.....	100	100	—	12	—	622	(a)	3,035
U.K. %.....	15		—		—		97	

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Unmanufactured tobacco, bright, flue-cured								
— \$ million.....	1.8	1.9	10.8	12.0	7.8	9.8	21.9	26.1
1937 = 100.....	100	100	585	644	424	528	1,186	1,404
U.K. %.....	99		90		80		84	
— lb. million.....	5.4	5.4	20.7	23.0	14.6	19.7	37.8	45.5
1937 = 100.....	100	100	385	424	273	363	705	840
U.K. %.....	99		90		74		83	
Bacon and hams, shoulders and sides, cured or smoked								
— \$ million.....	32.5	33.4	60.6	62.1	24.4	28.3	0	6.5
1937 = 100.....	100	100	187	186	75	85	0	19
U.K. %.....	97		98		86		0	
— cwt. 000.....	1,921	1,956	2,320	2,358	723	785	0	99
1937 = 100.....	100	100	121	121	38	40	0	5
U.K. %.....	98		98		92		0	
Cheese								
— \$ million.....	11.8	13.1	13.6	14.2	15.1	16.6	3.6	4.0
1937 = 100.....	100	100	115	108	127	127	31	31
U.K. %.....	91		96		91		90	
— cwt. 000.....	812	890	539	555	592	631	126	137
1937 = 100.....	100	100	66	62	73	71	16	15
U.K. %.....	91		97		94		92	
Eggs in the shell, other than frozen or for hatching								
— \$ million.....	0.3	0.4	24.5	25.3	0.2	3.6	—	1.7
1937 = 100.....	100	100	7,007	5,966	66	847	—	395
U.K. %.....	82		97		6		—	
— 100,000 lb. million.....	1.3	1.6	56.5	58.1	0.5	7.9	—	3.8
1937 = 100.....	100	100	4,194	3,628	35	493	—	235
U.K. %.....	84		97		6		—	

Major Items in Canada's Exports to the United Kingdom (cont'd)

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Planks and boards, Douglas fir								
— \$ million.....	9.6	15.4	35.6	65.6	8.6	83.9	22.4	137.4
1937 = 100.....	100	100	369	427	89	547	232	894
U.K. %.....	63		54		10		16	
— ft. million.....	473	739	524	878	122	1,147	262	1,785
1937 = 100.....	100	100	111	119	26	155	55	242
U.K. %.....	64		60		11		15	
Planks and boards, hemlock								
— \$ million.....	1.0	2.9	10.9	19.0	2.5	37.2	23.2	55.7
1937 = 100.....	100	100	1,087	648	253	1,269	2,319	1,903
U.K. %.....	34		57		7		42	
— ft. million.....	72	192	137	236	35	536	294	704
1937 = 100.....	100	100	190	123	49	279	408	367
U.K. %.....	38		58		7		42	
Planks and boards, spruce								
— \$ million.....	7.2	14.5	20.1	71.9	4.9	93.3	16.1	111.3
1937 = 100.....	100	100	280	497	68	645	224	769
U.K. %.....	50		28		5		14	
— ft. million.....	322	590	332	1,040	79	1,235	206	1,426
1937 = 100.....	100	100	103	176	25	209	64	242
U.K. %.....	55		32		6		14	
Newsprint								
— \$ million.....	4.7	126.5	4.6	342.3	1.9	485.7	33.0	665.9
1937 = 100.....	100	100	98	271	39	384	699	527
U.K. %.....	4		1		0		5	
— cwt. million.....	3	69	1	84	0	99	6	115
1937 = 100.....	100	100	37	122	13	143	193	167
U.K. %.....	4		1		0		5	

Major Items in Canada's Exports to the United Kingdom (cont'd)

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Aluminum in primary forms								
— \$ million.....	8.8	17.6	25.2	52.6	39.2	96.4	97.5	197.7
1937 = 100 (b).....	100	100	288	311	447	579	1,128	1,176
U.K. %.....	50		48		41		49	
— cwt. million.....	0.5	1.0	2.2	4.3	2.8	6.7	5.1	10.1
1937 = 100 (b).....	100	100	476	449	606	716	1,131	1,079
U.K. %.....	47		51		41		50	
Aluminum, semi-fabricated (c)								
— \$ million.....			0	2.1	—	5.5	1.5	9.1
1937 = 100.....			2		—		17	
U.K. %.....			1	78	—	229	75	333
— cwt. 000.....			2		—		23	
Aluminum wire and cable (d)								
— \$ million.....			—	2.5				
1937 = 100.....			—					
U.K. %.....								
Copper in ingots, bars, cakes, slabs and billets								
— \$ million.....	29.9	38.7	21.0	33.5	28.4	59.7	48.2	109.6
1937 = 100.....	100	100	70	87	95	154	161	283
U.K. %.....	77		63		48		44	
— cwt. million.....	2.3	3.0	1.1	1.7	1.3	2.7	1.4	3.1
1937 = 100.....	100	100	49	59	57	91	61	103
U.K. %.....	76		64		48		45	

Major Items in Canada's Exports to the United Kingdom (cont'd)

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Lead in pigs, refined lead								
— \$ million.....	10.9	17.0	10.6	29.1	2.2	32.2	12.9	22.1
1937 = 100.....	100	100	97	171	20	190	119	130
U.K. %.....	64		36		7		59	
— cwt. million.....	2.3	3.5	0.9	2.5	0.2	2.3	1.1	1.9
1937 = 100.....	100	100	38	71	7	65	49	53
U.K. %.....	65		35		7		61	
Nickel contained in matte or speiss								
— \$ million.....	8.0	14.5	9.0	18.3	18.5	46.4	33.1	79.0
1937 = 100.....	100	100	113	126	232	319	416	543
U.K. %.....	55		49		40		42	
— cwt. 000.....	442	808	391	795	416	1,062	552	1,319
1937 = 100.....	100	100	88	98	94	131	125	163
U.K. %.....	55		49		39		42	
Nickel, fine								
— \$ million.....	16.5	42.9	3.8	39.1	0.3	57.6	6.7	134.8
1937 = 100.....	100	100	23	91	2	134	41	314
U.K. %.....	39		10		1		5	
— cwt. 000.....	413	1,369	140	1,415	8	1,338	114	2,129
1937 = 100.....	100	100	34	103	2	98	28	156
U.K. %.....	30		10		1		5	
Platinum and other metals of the platinum group, contained in concentrates and other forms								
— \$ million.....	8.1	8.4	7.2	11.7	11.5	21.2	14.5	26.3
1937 = 100.....	100	100	89	139	142	253	179	314
U.K. %.....	97		62		54		55	

Major Items in Canada's Exports to the United Kingdom (concluded)

	1937		1947		1950		1955	
	U.K.	Total	U.K.	Total	U.K.	Total	U.K.	Total
Zinc spelter								
— \$ million.....	8.4	12.7	10.3	26.7	9.9	40.6	19.4	47.1
1937 = 100.....	100	100	123	209	118	319	232	370
U.K. %.....	66		39		24		41	
— cwt. million.....	1.8	2.7	1.1	2.7	0.7	2.9	1.9	4.3
1937 = 100.....	100	100	63	102	40	109	107	159
U.K. %.....	66		41		24		45	
Total of above items								
— \$ million.....	255.8	549.3	550.3	1,290.8	390.1	1,563.5	579.9	2,139.0
1937 = 100.....	100	100	215	235	153	285	227	389
U.K. %.....	47		43		25		27	
Total domestic merchandise exports (e)								
— \$ million.....	384.1	1,030.4	751.2	2,774.9	469.9	3,118.4	769.3	4,281.8
1937 = 100.....	100	100	196	269	122	303	200	416
U.K. %.....	37		27		15		18	

(a) Over 10,000.

(b) Covers primary and semi-fabricated aluminum in 1947, 1950 and 1955.

(c) Includes wire and cable in 1950 and 1955.

(d) Included with "aluminum manufactures, n.o.p." in 1937 and with semi-fabricated aluminum in 1950 and 1955.

(e) For comparability with the detailed items, exports to Newfoundland are included in the totals for 1937 and 1947.

Appendix G

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by the Department of Fisheries of Canada
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The Canadian Primary Iron and Steel Industry —
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The Canadian Automotive Industry —
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by Canadian Business Service Limited

The Canadian Primary Textiles Industry —
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- The Canadian Construction Industry —
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- The Canadian Chemical Industry —
by John Davis
- The Service Industries —
by The Bank of Montreal
- Probable Effects of Increasing Mechanization in Industry —
by The Canadian Congress of Labour, now
The Canadian Labour Congress
- Labour Mobility —
by The Trades and Labor Congress of Canada, now
The Canadian Labour Congress
- Skilled and Professional Manpower in Canada, 1945-1965 —
by The Economics and Research Branch, Department of Labour
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- Certain Aspects of Taxation Relating to Investment in Canada
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- Canada - United States Economic Relations* —
by Irving Brecher and S. S. Reisman
- Canadian Commercial Policy* —
by J. H. Young

* One of a series of three studies, including this volume, on Canadian international economic relations prepared under the direction of S. S. Reisman.

Some Regional Aspects of Canada's Economic Development —
by R. D. Howland

The Nova Scotia Coal Industry —
by Urwick, Currie Limited

Canadian Economic Growth and Development from 1939 to 1955 —
by J. M. Smith

Edmond Cloutier, C.M.G., O.A., D.S.P.
Queen's Printer and Controller of Stationery
Ottawa, 1957

